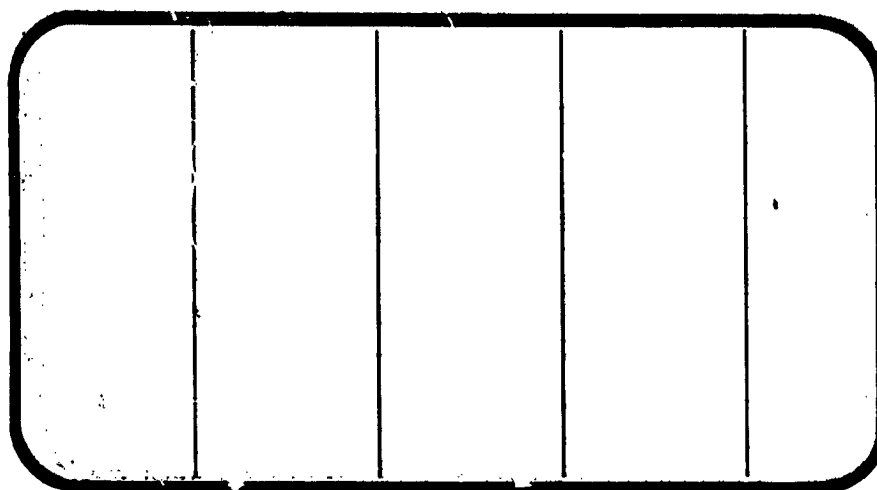




# NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



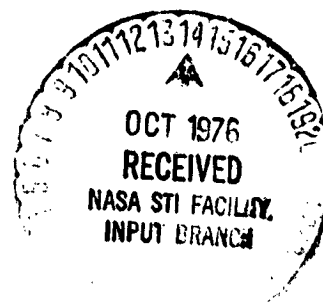
(NASA-CF-147615) HEAT TRANSFER TEST OF AN  
0.006-SCALE THIN-SKIN THERMOCOUPLE SPACE  
SHUTTLE MODEL (50-0, 41-T) IN THE NASA-AMES  
RESEARCH CENTER 3.5-FOOT HYPERSONIC WIND  
TUNNEL AT MACH 5.3 (IH28), VOLUME 1

N76-32230  
HC 21.25

G3/18 Unclass  
05280

SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT



JOHNSON SPACE CENTER

HOUSTON, TEXAS

DATA Management services

SPACE DIVISION



CHRYSLER  
CORPORATION

August, 1976

DMS-DR-2180  
NASA CR-147,615

VOLUME 1 OF 2

HEAT TRANSFER TEST OF AN 0.006-SCALE THIN-SKIN  
THERMOCOUPLE SPACE SHUTTLE MODEL (50-O, 41-T) IN  
THE NASA-AMES RESEARCH CENTER 3.5-FOOT HYPERSONIC  
WIND TUNNEL AT MACH 5.3 (IH28).

by

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Shuttle Aerosciences  
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NASA-Ames Research Center

Prepared Under Contract Number NAS9-13247

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Chrysler Corporation Space Division  
New Orleans, La. 70189

for

Engineering Analysis Division  
Johnson Space Center  
National Aeronautics and Space Administration  
Houston, Texas



WIND TUNNEL TEST SPECIFICS:

Test Number: ARC 3.5-195  
NASA Series Number: IH28  
Model Number: 50-0, 41-T  
Test Dates: May 17 through May 24, 1974  
Occupancy Hours: 88

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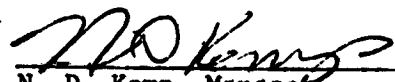
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HEAT TRANSFER TEST OF AN 0.006-SCALE THIN-SKIN  
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ABSTRACT

This report presents data obtained from a heat transfer test conducted on an 0.006-scale Space Shuttle Orbiter and External Tank in the NASA-Ames Research Center 3.5-foot Hypersonic Wind Tunnel. The purpose of this test was to obtain data under simulated return-to-launch-site abort conditions. Configurations tested were integrated orbiter and external tank, orbiter alone, and external tank alone at angles of attack of 0,  $\pm 30$ ,  $\pm 60$ ,  $\pm 90$ , and  $\pm 120$  degrees.

Runs were conducted at Mach numbers of 5.2 and 5.3 for Reynolds numbers of  $1.0 \times 10^6$  and  $4.0 \times 10^6$  per foot, respectively. Heat transfer data were obtained from 75 orbiter and 75 external tank iron-constantan thermocouples.

This report consists of 2 volumes. Volume 1 contains Figures 4-15; whereas, Volume 2 contains Figures 16-27 and the Tabulated Source Data.

## TABLE OF CONTENTS

	Page
ABSTRACT	111
INDEX OF MODEL FIGURES	2
INDEX OF DATA FIGURES	3
NOMENCLATURE	6
CONFIGURATIONS INVESTIGATED	10
MODEL INSTRUMENTATION	12
TEST FACILITY DESCRIPTION	13
TEST PROCEDURE	14
DATA REDUCTION	15
REFERENCES	18
TABLES	
I. TEST CONDITIONS	19
II. DATA SET/RUN NUMBER COLLATION SUMMARY	20
III. MODEL DIMENSIONAL DATA	22
IV. ORBITER THERMOCOUPLE LOCATIONS	29
V. EXTERNAL TANK THERMOCOUPLE LOCATIONS	31
VI. RUN NUMBER/TUNNEL CONDITION SUMMARY	32
FIGURES	
MODEL	34
DATA (VOLUME 1 - FIGURES 4-15)	43
(VOLUME 2 - FIGURES 16-27)	43
APPENDIX	
TABULATED SOURCE DATA (VOLUME 2)	

# INDEX OF MODEL FIGURES

Figures	Title	Page
1.	Orbiter/External Tank General Layout	34
2.	Model Instrumentation Sketches	
	a. 50-O Orbiter -- 147-B Configuration Thermo- couple Locations.	35
	b. 41-T 0.006-Scale External Tank T/C Loca- tions.	37
	c. Specific Heat vs. Temperature for 17-4PH and 15-5PH stainless steel.	38
3.	Model Installation Photographs	
	a. Orbiter/Tank at 0.0 degrees.	39
	b. Orbiter/Tank at -60.0 degrees.	40
	c. Orbiter/Tank at 90.0 degrees.	41
	d. Orbiter/Tank at 120.0 degrees.	42

# INDEX OF DATA FIGURES

FIGURE NUMBER	TITLE	SCHEDULE OF		CONDITIONS VARYING	PAGES
		COEFFICIENTS PLOTTED			
VOLUME 1					
4	TANK, ALONE	(A)		HAW/HT, PHI, ALPHA, RN/L, X/L, MACH	1-112
5	TANK, IN THE PRESENCE OF ORBITER	(A)		HAW/HT, PHI, ALPHA, RN/L, X/L, BETA, MACH	113-336
6	TANK, RATIO OF INTERFERENCE TO UNDISTURBED	(B)		PHI, ALPHA, X/L	337-373
7	ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE	(C)		HAW/HT, BP, ALPHA	374-395
8	ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK	(C)		HAW/HT, BP, ALPHA RN/L, BETA, MACH	396-427
9	ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED	(D)		BP, ALPHA	428-440
10	ORBITER BODY SIDEWALL, ORBITER ALONE	(E)		HAW/HT, Z, ALPHA, X/L	441-528
11	ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK	(E)		HAW/HT, Z, ALPHA RN/L, X/L, BETA, MACH	529-656
12	ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED	(F)		Z, ALPHA, X/L	657-690
13	OMS PODS, ORBITER ALONE	(E)		HAW/HT, X/L, ALPHA, Z	691-720
14	OMS PODS, ORBITER IN PRESENCE OF THE TANK	(E)		HAW/HT, X/L, ALPHA, RN/L, BETA, Z, MACH	721-768
15	OMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED	(D)		Z, ALPHA	769-789

# INDEX OF DATA FIGURES (Continued)

FIGURE NUMBER	TITLE	SCHEDULE OF COEFFICIENTS PLOTTED		CONDITIONS VARYING	PAGES
VOLUME 2 16	CHINE, ORBITER ALONE	(C)		HAW/HT, ALPHA	790-800
17	CHINE, ORBITER IN PRESENCE OF THE TANK	(C)		HAW/HT, ALPHA, RN/L, MACH	801-811
18	CHINE, RATIO OF INTERFERENCE TO UNDISTURBED	(D)		ALPHA	812-822
19	LEFT WING LOWER SURFACE, ORBITER ALONE	(G)		HAW/HT, 2Y/B, ALPHA	823-855
20	LEFT WING LOWER SURFACE, ORBITER IN PRESENCE OF TANK	(G)		HAW/HT, 2Y/B, ALPHA, RN/L, BETA, MACH	856-903
21	LEFT WING LOWER SURFACE, RATIO OF INTERFERENCE TO UNDISTURBED	(H)		2Y/B, ALPHA	904-918
22	RIGHT WING UPPER SURFACE, ORBITER ALONE	(I)		HAW/HT, 2Y/B, ALPHA, X/C	919-995
23	RIGHT WING UPPER SURFACE, ORBITER IN PRESENCE OF TANK	(I)		HAW/HT, 2Y/B, ALPHA, RN/L, BETA, X/C, MACH	996-1107
24	RIGHT WING UPPER SURFACE, RATIO OF INTERFERENCE TO UNDISTURBED	(J)		2Y/B, ALPHA, X/C	1108-1139
25	VERTICAL TAIL, ORBITER ALONE	(G)		HAW/HT, Z, ALPHA	1140-1161
26	VERTICAL TAIL, ORBITER IN PRESENCE OF TANK	(G)		HAW/HT, Z, ALPHA RN/L, BETA, MACH	1162-1193
27	VERTICAL TAIL, RATIO OF INTERFERENCE TO UNDISTURBED	(H)		Z, ALPHA	1194-1206

INDEX OF DATA FIGURES (Concluded)

SCHEDULE OF COEFFICIENTS PLOTTED:

- (A) H/HREF versus X/L  
H/HREF versus PHI
- (B) HI/HU versus X/L  
HI/HU versus PHI
- (C) H/HREF versus X/L
- (D) HI/HU versus X/L
- (E) H/HREF versus X/L  
H/HREF versus Z
- (F) HI/HU versus X/L  
HI/HU versus Z
- (G) H/HREF versus X/C
- (H) HI/HU versus X/C
- (I) H/HREF versus X/C  
H/HREF versus 2Y/B
- (J) HI/HU versus X/C  
HI/HU versus 2Y/B

# NOMENCLATURE

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
b		thickness of model skin, in.
B	BREF	span length, in.
C		specific heat of model skin material, BTU/lb <sub>m</sub> -°R
c		chord length, in.
C <sub>0</sub> , C <sub>1</sub> , C <sub>2</sub>		constants in curve fit for C over model wall temperature range
c <sub>p</sub>		specific heat of air stream (perfect gas value), BTU/lb <sub>m</sub> -°R
CHAN	CHAN	Recording-system channel
H <sub>aw</sub>	HAW	adiabatic wall enthalpy, BTU/lb <sub>m</sub>
H <sub>t</sub>	HT	free-stream total enthalpy, BTU/lb <sub>m</sub>
	HO	average of free-stream total enthalpy values of all tunnel runs incorporated into an aero data-set, BTU/lb <sub>m</sub>
H <sub>w1</sub>	HW	enthalpy based on model wall temperature for given T/C location at initial time, BTU/lb <sub>m</sub>
h	H	heat-transfer coefficient at model wall for given T/C location
h <sub>s</sub>	HS, HREF	stagnation-point heat-transfer coefficient for reference sphere
h/h <sub>s</sub>	H/HS, H/HREF	ratio of model heat-transfer coefficient to heat-transfer coefficient of reference sphere for H <sub>aw</sub> /H <sub>t</sub> = X.XXX
IML		inner mold line
L	LREF, LENGTH	model reference length, in. or ft.
M <sub>∞</sub>	MACH	free-stream Mach number
H <sub>w</sub>		enthalpy based on model wall temperature, BTU/lb <sub>m</sub>



# NOMENCLATURE (Continued)

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
$P_t$	PT	free-stream total pressure, psia
	PO	average of free-stream total pressure values of all tunnel runs incorporated into an aero dataset, psia
$\dot{q}_1$	QDOT,Q	heat-transfer rate at model wall for given T/C location at initial time, BTU/ft <sup>2</sup> -sec
$\dot{q}_s$	QS, QREF	stagnation-point heat-transfer rate for reference sphere at initial time, BTU/ft <sup>2</sup> -sec
$R_s$	RS	reference sphere radius at model scale equivalent to 0.305 m (1 ft) for full-scale vehicle
$Re_\infty/ft$	RE/FT	free-stream Reynolds number per foot
	RN/L	average of free-stream Reynolds number values (per foot) of all tunnel runs incorporated into an aero dataset
$Re_\infty, L$	REL	free-stream Reynolds number based on model reference length, L
	S/R	body wetted running length
St	ST	Stanton number based on free-stream flow conditions and the model heat-transfer coefficient for $H_{aw}/H_t = X.XXX$
T		temperature, °R
$T_t$	TT	free-stream total temperature, °R
	TO	average of free-stream total temperature values of all tunnel runs incorporated into an aero dataset, °R
$T_{w_1}$	TW	model wall temperature for given T/C location at initial time, °R

# NOMENCLATURE (Continued)

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
T/C	T/C	thermocouple
t		time, sec
t <sub>i</sub>	TIME	initial time (before model insertion into flow) extrapolated from f(T <sub>w</sub> ) vs. time, sec
u, V		velocity, ft/sec
W		density of model skin material lb <sub>m</sub> /ft <sup>3</sup>
X		axial distance measured from nose, in.
	X/C	chordwise location, fraction of local chord
	X/L	longitudinal location, fraction of body length
Y		spanwise distance from centerline, in.
2y/B	2Y/B	spanwise location, fraction of semi-span
Z	Z	water plane distance, in.
	Z/BV	spanwise location on vertical tail, fraction of exposed span
α	ALPHA	angle of attack, degrees
β	BETA	angle of sideslip, degrees
μ		viscosity of air, lb-sec/ft <sup>2</sup>
ρ		density of air, lb <sub>m</sub> /ft <sup>3</sup>
θ	THETA	external tank angular surface coordinate, measured clockwise looking forward. 0 degrees at bottom centerline, degrees
φ	PHI	orbiter angular surface coordinate, measured clockwise looking forward. 0 degrees at bottom centerline, degrees

# NOMENCLATURE (Concluded)

<u>SYMBOL</u>	<u>PLOT SYMBOL</u>	<u>DEFINITION</u>
W.P.		water plane, height measured along Z axis, in.
B.L.	BP	butt plane, distance from orbiter centerline in the outboard direction, in.
	HI/HU	ratio of interference to undisturbed heat transfer coefficients
	ZMRP	moment reference point on Z axis
	YMRP	moment reference point on Y axis
	XMRP	moment reference point on X axis
	SREF	reference length or wing mean aerodynamic chord; ft.

## SUBSCRIPTS

aw	adiabatic wall
i	initial value before model insertion
O	Orbiter
PG	perfect gas (calorically and thermally perfect gas)
s	reference sphere
t	free-stream total condition
T	tank
V	vertical tail
W	wall
$\infty$	free-stream

## CONFIGURATIONS INVESTIGATED

The model (Orbiter and External Tank) tested was a 0.006-scale representation of the Rockwell International Space Shuttle Vehicle. The Orbiter and External Tank are defined by Rockwell lines SS-H-01414 and SS-H-01415.

The Orbiter and Tank were initially built by Grumman Aircraft, Bethpage, New York, but the Orbiter was modified with additional thermocouples added to the upper surface of the left wing, vertical tail, and OMS pod. Modifications of both Orbiter and External Tank stings were accomplished to carry increased loading within the high angle of attack range.

The Orbiter was a full span (cast stainless steel) model with thin-skin inserts. Thin-skin stainless steel (17-4PH) inserts were located on the underside region, left-hand wing (top and bottom), windshield area, left fuselage side, OMS pod, and vertical tail. These inserts were instrumented with 89 iron-constantan thermocouples of which only 75 were used during this test. The model was built with all control surfaces in the 0° deflection condition.

The External Tank was constructed of thin-skin (15-5PH) stainless steel. The Tank was instrumented with 111 iron-constantan thermocouples, of which only 75 were used.

The Orbiter and External Tank were designed so either could be tested alone or in the second stage configuration.

# CONFIGURATIONS INVESTIGATED (Concluded)

The following configuration components were tested:

<u>Notation</u>	<u>Description</u>
B <sub>22</sub>	Fuselage (1-147B Lines)
C <sub>7</sub>	Canopy
F <sub>5</sub>	Body Flap
M <sub>4</sub>	OMS Pods
V <sub>7</sub>	Vertical Tail
W <sub>111</sub>	Wing
T <sub>8</sub>	External Tank (-139 Lines)

## MODEL INSTRUMENTATION

The Orbiter and External Tank were instrumented with 200 iron-constantan thermocouples, but only 150 were used for this test. All thermocouples were spotwelded to thin-skin (nominal skin thickness of 0.030 in.) stainless steel inserts and the leads were clamped in bundles within the model. The exact T/C locations for the Orbiter and External Tank are presented in Tables IV and V, respectively, and illustrated in Figures 2a and 2b, respectively. The T/C leads were 50 feet long and fitted with Cannon Plug connectors.

### TEST FACILITY DESCRIPTION

The NASA-Ames 3.5-foot Hypersonic Wind Tunnel is a closed-circuit, blowdown-type tunnel capable of operating at nominal Mach numbers of 5, 7, and 10 at pressures to 1800 psia and temperatures of 3400°R for run times to four minutes. The major components of the facility include a gas storage system where the test gas is stored at 3000 psi, a storage heater filled with aluminum-oxide pebbles capable of heating the test gas to 3400°R, axisymmetric contoured nozzles with exit diameters of 42 inches for generating the desired Mach number, and a 900,000 ft<sup>3</sup> vacuum storage system which operates to pressures of 0.3 psia. The test section itself is an open-jet type enclosed within a chamber approximately 12-feet in diameter and 40-feet in length, arranged transversally to the flow direction.

A model support system is provided that can pitch models through an angle-of-attack range of -20 to +20 degrees, in a vertical plane, about a fixed point of rotation on the tunnel centerline. This rotation point is adjustable from 1 to 5 feet from the nozzle exit plane. The model normally is out of the test stream (strut centerline 37 inches from tunnel centerline) until the tunnel test conditions are established after which it is inserted. Insertion time is adjustable to as little as  $\frac{1}{2}$  second and models may be inserted at any strut angle.

A high-speed, analog-to-digital data acquisition system is used to record test data on magnetic tape. The present system is equipped to measure and record the outputs from 80 transducers in addition to 20 channels of tunnel parameters.

## TEST PROCEDURE

Heat Transfer Data were obtained by measuring the temperature rise over a period of time from a total of 150 iron-constantan thermocouples. The model was injected into the flow in approximately 1 second and held on tunnel centerline for approximately 1 second. Temperature measurements and tunnel conditions were recorded on magnetic tape at 0.07-second intervals by the data acquisition system from the start of model injection to the start of model retraction.

A maximum of 75 thermocouples could be recorded for any given run. The thermocouple leads were routed from the model through the tunnel model-injection mechanism, and connected to a junction box which was wired directly to a thermocouple reference-temperature (150°F) box. The junction box connectors were wrapped with asbestos for heat protection from the tunnel test-chamber ambient conditions (no free-stream flow on box).. Thermocouple changes were accomplished by changing 5 Cannon Plugs containing 15 thermocouples each. Prior to testing, a thermocouple heat-response check, through the data-acquisition system, was performed on all thermocouples to assure proper hook-up, polarity and response.

Prior to each run with model attitude changes, the model was leveled in pitch and roll by means of leveling blocks which attach to the sting assembly of the Orbiter/External Tank. When leveling the models, an inclinometer was placed on the leveling plate. Proper roll relationships between the models were set using scribed lines on the model stings.



# DATA REDUCTION

All test data were reduced at the NASA/Ames Research Center using the data-reduction techniques outlined below. The thermocouple data were reduced using the one-dimensional, thin-wall equation:

$$\dot{q} = W C_b \frac{dT_w}{dt} = h (H_{aw} - H_w) \equiv h H_t \left( \frac{H_{aw}}{H_t} - \frac{H_w}{H_t} \right) \quad (1)$$

which neglects heat-conduction losses.

Assuming that  $W$  and  $h$  are constant and

$$C = C_0 + C_1 T_w + C_2 T_w^2 \text{ for } T_w \text{ ranges} \quad (2)$$

the integration of equation (1) for  $t = t_1$  to  $t$  and  $T_w = T_{w1}$  to  $T_w$  yields the linear equation:

$$f(T_w) = -\ln \left( \frac{T_{aw}^i - T_w}{T_{aw}^i - T_{w1}} \right) - \left[ \frac{C_1}{C_{aw}^i} + \frac{C_2}{C_{aw}^i} \left( T_{aw}^i + \frac{T_w + T_{w1}}{2} \right) \right] (T_w - T_{w1})$$

$$= \frac{h c_p}{W C_{aw}^i b} (t - t_1) \quad (3)$$

where it is defined that:

$$T_{aw}^i \equiv \frac{H_{aw}}{c_p} \equiv \frac{H_{aw}}{H_t} \frac{H_t}{c_p} \approx (T_{aw})_{PO} \quad (4)$$

$$C_{aw}^i \equiv C_0 + C_1 T_{aw}^i + C_2 T_{aw}^i{}^2 \quad (5)$$

$\frac{h}{b}$  specific heat at adiabatic wall temperature

# DATA REDUCTION (Continued)

The form of Eq (3) is  $f(T_w) = mt + a$  where  $m$  is the slope and  $a$  is the intercept for a straight line if heat-conduction errors are negligible. Thus, deviations from a straight line can indicate heat-conduction effects.

The slope,  $m$ , of  $f(T_w)$  vs  $t$  from Eq (3) is computed by a least-squares, straight-line fit over a finite time interval (approx. 1 sec) beginning when the model reaches uniform tunnel flow. The value of the heat-transfer coefficient,  $h$ , is then determined from:

$$h = \frac{WJ_{aw}^2 b}{c_p} m \quad (6)$$

Using this value of  $h$ , the heat-transfer rate is evaluated at the initial time,  $t_1$ , when the model is isothermal at the initial wall enthalpy,

$$\dot{q} = \dot{q}_1 = h (H_{aw} - H_{w1}) \equiv h H_t \left( \frac{H_{aw}}{H_t} - \frac{H_{w1}}{H_t} \right) \quad (7)$$

where  $H_{aw}/H_t$  is the same value used to evaluate  $h$ . The resultant value of  $\dot{q}$  is independent of the value of  $H_{aw}/H_t$  used for both the  $h$  and  $\dot{q}$  evaluations.

The reference sphere heating is also evaluated at the initial wall enthalpy by the method of Fay and Riddell

$$\dot{q}_s = h_s (H_t - H_{w1}) \equiv h_s H_t \left( 1.0 - \frac{H_{w1}}{H_t} \right) \quad (8)$$

The model-to-sphere ratio of heat-transfer coefficients is then determined from Eqs. (7) and (8) as

$$\frac{h}{h_s} = \frac{\dot{q}_1}{\dot{q}_s} \left[ \frac{1.0 - H_{w1}/H_t}{H_{aw}/H_t - H_{w1}/H_t} \right] \quad (9)$$

#### DATA REDUCTION (Concluded)

where  $\dot{q}_1$  is constant for all values of  $H_{aw}/H_t$ .

To determine  $h/h_s$  for various values of  $H_{aw}/H_t$ , the particular value of  $H_{aw}/H_t$  is substituted into Eq. (9).

The Stanton number is defined as

$$St \equiv \frac{h}{\rho u} = \frac{\dot{q}_1}{\rho u (H_{aw} - H_{w1})} \quad (10)$$

where for free-stream conditions,  $\rho u = \rho_\infty V_\infty$ .

The calculations of the model heating, reference sphere heating, and Reynolds number included the corrections of NACA report 1135 (Ref. 3) for calorically imperfect, thermally perfect air. Keyes' equation for viscosity (Ref. 4) was also used for the sphere heating and Reynolds number computations:

$$\mu = \frac{0.0232 \times 10^{-6} T^{0.5}}{1 + \frac{220}{T} \times 10^{-9/T}} \quad (11)$$

where the units for  $T$  and  $\mu$  are  $^{\circ}R$  and  $lb\text{-}sec/ft^2$ , respectively.

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1. Walstad, D. G.: Pretest Information for Tests of an 0.006-Scale Thin-Skin Space Shuttle Heat Transfer Model (50-O, 41-T) in the Ames Research Center 3.5-foot HWT Wind Tunnel Test IH28. SD-74-SH-0135, March 27, 1974.
2. Fuy, J. A.; and Riddell, F. R.: Theory of Stagnation Point Heat Transfer in Dissociated Air. J. Aeron. Sci., Vol. 25, No. 1, February, 1958, pp 73-85.
3. Ames Research Staff: Equations, Tables, and Charts for Compressible Flow. NACA Rept. 1135. 1953.
4. Bertram, Mitchel H.: Comment on "Viscosity of Air." J. Spacecraft and Rockets, Vol. 4, No. 2, February, 1967, pp 287-288.

### TABLE I.

[illegible]

**TABLE II.**

DATA SET / RUN NUMBER COLLATION SUMMARY										DATE : JUNE, 1974	
DATA SET IDENTIFIER	CONFIGURATION	SCHD. PARAMETERS/VALUES			NO. OF RUNS	MODEL THERMOCOUPLE HOOKUP					
		α	β	R <sub>e</sub> *		M <sub>92</sub>	T <sub>i</sub>	Q <sub>i</sub>			
REV001	Q <sub>i</sub> T <sub>i</sub>	0	0	1.0	5.2	2	2	1			
02		30					3	7			
03		60					4	5			
04		90					17	18			
05		120					20	19			
06		120					21	22			
07		90					24	23			
08		60					13	14			
09		30					16	15			
10		60		4.0	5.3		12	6			
11		30		4.0	5.3		10	11			
12		30		5	1.0	5.2	9	8			
13	T <sub>i</sub>	0	0			1	33	—			
14		30					31	—			
15		60					32	—			
16		90					37	—			
17		120					38	—			

TEST : IH28 (ARC 3:5-195)

DATE : JUNE, 1974

DATA SET / RUN NUMBER COLLATION SUMMARY

MODEL THERMOCOUPLE HOOKUP

TYPE OF DATA

COEFFICIENT SCHEDULES

\* ~X10<sup>-6</sup> PER FT.

Q<sub>i</sub> - ORBITER THERMOCOUPLE HOOKUP (CONST. SET 100)

T<sub>i</sub> - TANK THERMOCOUPLE HOOKUP (CONST. SET 200)

IDVAR (1)

IDVAR (2)

NDV

**TABLE II. (Concluded)**

[illegible]

The 4th character of the dataset identifier describes the T/C location.

- | A | - | underside fuselage | C | - | OMS pods | F | - | wing lower surface |
|---|---|--------------------|---|---|----------|---|---|--------------------|
| T | - | external tank      | D | - | chine    | G | - | wing upper surface |
| B | - | body sidewall      | E | - | canopy   | H | - | vertical tail      |

TABLE III  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: BODY - B22

GENERAL DESCRIPTION: Fuselage, Configuration 3A per Rockwell Lines  
VL70-000147B.

NOTE: Identical to B19, except underside.

Model Scale = 0.006

DRAWING NUMBER: VL70-000147B

DIMENSIONS:

	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length - in	<u>1290.3</u>	<u>7.742</u>
Max. Width - in	<u>267.6</u>	<u>1.606</u>
Max. Depth - in	<u>244.5</u>	<u>1.467</u>
Fineness Ratio	<u>4.84601</u>	<u>4.84601</u>
Area - Ft <sup>2</sup>		
Max. Cross-Sectional	<u>386.67</u>	<u>0.0139</u>
Planform	<u>          </u>	<u>          </u>
Wetted	<u>          </u>	<u>          </u>
Base	<u>          </u>	<u>          </u>



TABLE III (Continued)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: Canopy - C7

GENERAL DESCRIPTION: Configuration 3 per Rockwell Lines VL70-000139

\_\_\_\_\_

\_\_\_\_\_

Model Scale = 0.006

DRAWING NUMBER VL70-000139

<u>DIMENSION:</u>	<u>FULL SCALE</u>	<u>MODEL SCALE</u>
Length ( $X_0 = .433$ to $X_0 = 670$ ) - in. FS	<u>237</u>	<u>1.422</u>
Max Width	<u>                    </u>	<u>                    </u>
Max Depth ( $Z_0 =$ to $Z_0 = 501$ ) - in FS	<u>                    </u>	<u>                    </u>
Fineness Ratio	<u>                    </u>	<u>                    </u>
Area		
Max Cross-Sectional	<u>                    </u>	<u>                    </u>
Planform	<u>                    </u>	<u>                    </u>
Wetted	<u>                    </u>	<u>                    </u>
Base	<u>                    </u>	<u>                    </u>

TABLE III (Continued)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: F5 Body Flap

GENERAL DESCRIPTION: 3 Configuration per Rockwell Lines VL70-000139

Scale Model = 0.006

DRAWING NUMBER

VL70-000139

DIMENSION:

FULL SCALE

MODEL SCALE

Length - in

84.70

.508

Max Width - in

267.6

1.606

Max Depth

Fineness Ratio

Area - Ft<sup>2</sup>

Max Cross-Sectional

Planform

Wetted

Base

142.5

.005

38.0958

.0014

TABLE III (Continued)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: O/S Pod - M<sub>4</sub>

GENERAL DESCRIPTION: Configuration 3 per Rockwell Lines VL70-000139

NOTE: M<sub>4</sub> identical to M<sub>3</sub>, except intersection to fuselage.

Model Scale = 0.006

DRAWING NUMBER VL70-000139

<u>DIMENSION:</u>	<u>FULL SCALE</u>	<u>MODEL SCALE</u>
Length - IN	<u>346.0</u>	<u>2.076</u>
Max Width - IN	<u>108.0</u>	<u>.648</u>
Max Depth - IN	<u>113.0</u>	<u>.678</u>
Fineness Ratio	<u>          </u>	<u>          </u>
Area - FT <sup>2</sup>	<u>          </u>	<u>          </u>
Max Cross-Sectional	<u>          </u>	<u>          </u>
Planform	<u>          </u>	<u>          </u>
Wetted	<u>          </u>	<u>          </u>
Base	<u>          </u>	<u>          </u>

TABLE III (Continued)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: T8 - EXTERNAL TANK

GENERAL DESCRIPTION: 2A Configuration per Rockwell Lines:

VL73-000018 and VL72-000061 "C" Body of Revolution

Scale Model = 0.006

DRAWING NUMBER VL73-000018

<u>DIMENSION:</u>	<u>FULL SCALE</u>	<u>MODEL SCALE</u>
Length - In. (Nose @ $X_T = 309$ )	<u>186.50</u>	<u>1.119</u>
Max Width (Dia) - In.	<u>324.0</u>	<u>1.944</u>
Max Depth	<u>          </u>	<u>          </u>
Fineness Ratio L/D	<u>6.1389</u>	<u>6.1389</u>
Area - Ft. <sup>2</sup>		
Max Cross-Sectional	<u>572.56</u>	<u>0.02061</u>
Planform	<u>          </u>	<u>          </u>
Wetted	<u>          </u>	<u>          </u>
Base	<u>          </u>	<u>          </u>
WP of tank centerline, ( $Z_T$ ) In.	<u>400.0</u>	<u>2.400</u>

TABLE III (Continued)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: VERTICAL - V 7

GENERAL DESCRIPTION: Centerline Vertical Tail, Doublewedge Airfoil

with Rounded Leading Edge

NOTE: Same as V5, but with manipulator housing removed.

Model Scale = 0.006

DRAWING NUMBER:

VL70-000139

DIMENSIONS:

FULL-SCALE

MODEL SCALE

TOTAL DATA

Area (Theo) Ft <sup>2</sup>	<u>425.92</u>	<u>0.0153</u>
Planform		
Span (Theo) In	<u>315.72</u>	<u>1.894</u>
Aspect Ratio	<u>1.675</u>	<u>1.675</u>
Rate of Taper	<u>0.507</u>	<u>0.507</u>
Taper Ratio	<u>0.404</u>	<u>0.404</u>
Sweep Back Angles, degrees		
Leading Edge	<u>45.000</u>	<u>45.000</u>
Trailing Edge	<u>26.249</u>	<u>26.249</u>
0.25 Element Line	<u>41.130</u>	<u>41.130</u>
Chords:		
Root (Theo) WP	<u>268.50</u>	<u>1.611</u>
Tip (Theo) WP	<u>108.47</u>	<u>0.651</u>
MAC	<u>199.81</u>	<u>1.199</u>
Fus. Sta. of .25 MAC	<u>1463.50</u>	<u>8.781</u>
W. P. of .25 MAC	<u>635.522</u>	<u>3.813</u>
B. L. of .25 MAC	<u>0.00</u>	<u>0.00</u>
Airfoil Section		
Leading Wedge Angle Deg	<u>10.000</u>	<u>10.000</u>
Trailing Wedge Angle Deg	<u>14.920</u>	<u>14.920</u>
Leading Edge Radius	<u>2.0</u>	<u>2.0</u>
Void Area	<u>13.17</u>	<u>0.0005</u>
Blanketed Area	<u>0.00</u>	<u>0.00</u>

TABLE III (Concluded)  
MODEL DIMENSIONAL DATA

MODEL COMPONENT: WING-W 111

GENERAL DESCRIPTION: Configuration 3A per Rockwell Lines VL70-000147B.

NOTE: Identical to W107, except lowered 3.5" and increased cuff incidence.

Model Scale = 0.006

TEST NO.

DWG. NO. VL70-000147B

DIMENSIONS:

FULL-SCALE

MODEL SCALE

TOTAL DATA

Area (Theo.)  $\text{Ft}^2$

Planform

Span (Theo) In.

Aspect Ratio

Rate of Taper

Taper Ratio

Dihedral Angle, degrees (@ T.E. of Elevon)

Incidence Angle, degrees

Aerodynamic Twist, degrees

Sweep Back Angles, degrees

Leading Edge

Trailing Edge

0.25 Element Line

Chords:

Root (Theo) B.P.O.O.

Tip, (Theo) B.P.

MAC

Fus. Sta. of .25 MAC

W.P. of .25 MAC

B.L. of .25 MAC

EXPOSED DATA

Area (Theo)  $\text{Ft}^2$

Span, (Theo) In. BP108

Aspect Ratio

Taper Ratio

Chords

Root BP108

Tip  $1.00 \frac{b}{2}$

MAC

Fus. Sta. of .25 MAC

W.P. of .25 MAC

B.L. of .25 MAC

Airfoil Section (Rockwell Mod NASA)

XXXX-64

Root  $\frac{b}{2}$  = @  $Y_0$  199 to NACA 0010

Tip  $\frac{b}{2}$  =

Data for (1) of (2) Sides

Leading Edge Cuff  $\text{Ft}^2$

Planform Area

Leading Edge Intersects Fus M. L. @ Sta

Leading Edge Intersects Wing @ Sta

2690.00

0.0968

936.68

5.620

2.265

2.265

1.177

1.177

0.200

0.200

3.500

3.500

0.500

0.500

+3.000

+3.000

45.000

45.000

-10.24

-10.24

35.209

35.209

689.24

4.135

137.85

0.827

474.81

2.49

1136.89

6.821

295.70

1.774

182.13

1.093

1752.29

0.063

720.68

4.324

2.058

2.058

0.2451

0.2451

562.40

3.374

137.85

0.827

393.03

2.358

1185.31

7.112

296.70

1.780

251.76

1.511

0.10

0.10

0.12

0.12

118.444

0.0043

500.0

3.000

1083.5

6.501

TABLE IV ORBITER THERMOCOUPLE LOCATIONS

T/C No.	Skin Thick	LOCATION					T/C No.	Skin Thick	LOCATION				
		x/l	x/c	y	b/2	z			x/l	x/c	y	b/2	z
1	.035	.025					35	.035	.60				
2		.050					36	.034	.70				
3		.075					37	.032	.70				
4	.034	.10					38	.035	.70				
5	.033	.125					39		.825				
6		.150					40		.825		OMS PODS		
7	.034	.175	UNDERSIDE				41		.825				
8		.20	FUSELAGE				42		.90				
9	.035	.25	BP = 0.0				43		.90				
10		.30					44		.90				
11	.034	.40					45	.035	.10				
12	.035	.50					46		.15		CHINE		
13		.65					47		.20				
14		.80					48		.17		CANOPY		
15	.036	.95					49*		.425		MID FUSE		
16	.030	.35					50	.031		.05		40%	
17	.027	.40	UNDERSIDE				51	.030		.10		40%	
18		.50	FUSELAGE				52*	.030		.20		40%	
19 *		.60	BP = 117.0				53	.029		.30		40%	
20		.70					54*	.028	WING	.40		40%	
21 *	.028	.80					55		LWR	.50		40%	
22	.031	.90					56*			.60		40%	
23 *	.036	1.00					57			.70		40%	
24	.034	.30					58*	.029		.80		40%	
25	.033	.30					59			.90		40%	
26	.034	.30	BODY				60	.034		.10		60%	
27	.035	.40	SIDEWALL				61	.032		.20		60%	
28	.034	.40					62*	.031		.30		60%	
29	.035	.40					63*	.030	WING	.40		60%	
30		.50					64*		LWR	.50		60%	
31	.034	.50					65			.60		60%	
32	.035	.50					66*			.70		60%	
33		.60					67*			.80		60%	
34	.033	.60					68			.90		60%	

TABLE IV ORBITER THERMOCOUPLE LOCATIONS (Concluded)

T/C No.	Skin Thick.	LOCATION					T/C No.	Skin Thick.	LOCATION				
		x/l	x/c	y	b/2	z			x/l	x/c	y	b/2	z
69	.034	↑	.20		80%								
70		WING	.40		80%								
71 *		LWR	.60		80%								
72	.035	↑	.80		80%								
73	.035	↑	.20		40%								
74	.034	WING	.40		40%								
75	.035	UP	.60		40%								
76	.037	↑	.80		40%								
77	.034	↑	.20		60%								
78	.030	WING	.40		60%								
79	.030		.60		60%								
80	.031	↑	.80		60%								
81	.027	↑	.20		80%								
82	.028	WING	.40		80%								
83	.028	UP	.60		80%								
84	.028	↑	.80		80%								
85	.039	↑	.25			3.57							
86	.040	VERT	.50			3.57							
87	.037		.75			3.57							
88	.033	VERT	.35			4.42							
89	.034	↑	.6			4.42							
* Data were not obtained at these T/C locations.													



TABLE V EXTERNAL TANK THERMOCOUPLE LOCATIONS

T/C NO.	SKIN THICK.	LOCATION		T/C NO.	SKIN THICK.	LOCATION		T/C NO.	SKIN THICK.	LOCATION	
		X/1	Φ DEG.			X/1	Φ DEG.			X/1	Φ DEG.
1	0.037	0	NOSE	34	0.032	0.40	135	67	0.030	0.60	45
2	0.030	0.005	180	35	0.033	0.40	112.5	68	0.030	0.60	0
3	0.030	0.010		36	0.033	0.40	90	69 *	0.033	0.625	180
4	0.030	0.020		37	0.030	0.40	67.5	70	0.033	0.65	180
5	0.030	0.04		38	0.029	0.40	45	71	0.032	0.65	157.5
6	0.030	0.06		39	0.031	0.40	0	72	0.031	0.65	135
7	0.029	0.08		40	0.032	0.425	180	73	0.030	0.65	112.5
8	0.029	0.10		41	0.032	0.45	180	74 *	0.030	0.65	90
9	0.028	0.125		42	0.033	0.45	157.5	75 *	0.030	0.65	67.5
10	0.028	0.15		43	0.031	0.45	135	76 *	0.033	0.675	180
11	0.028	0.175		44	0.031	0.45	112.5	77	0.033	0.70	180
12	0.028	0.20	180	45 *	0.031	0.45	90	78	0.032	0.70	157.5
13	0.028	0.20	90	46	0.033	0.475	180	79	0.032	0.70	135
14 *	0.032	0.25	180	47	0.033	0.50	180	80 *	0.031	0.70	112.5
15 *	0.029	0.25	90	48	0.033	0.50	157.5	81	0.030	0.70	90
16 *	0.030	0.275	112.5	49	0.032	0.50	135	82 *	0.031	0.70	67.5
17 *	0.030	0.275	90	50	0.033	0.50	112.5	83 *	0.029	0.70	45
18	0.034	0.30	180	51	0.031	0.50	90	84	0.033	0.75	180
19 *	0.031	0.30	112.5	52 *	0.031	0.50	67.5	85	0.033	0.75	157.5
20 *	0.031	0.30	90	53 *	0.030	0.50	45	86	0.032	0.75	135
21 *	0.030	0.30	67.5	54	0.032	0.525	180	87 *	0.031	0.75	112.5
22 *	0.031	0.325	135	55	0.032	0.55	180	88 *	0.031	0.75	90
23 *	0.031	0.325	112.5	56	0.033	0.55	157.5	89 *	0.030	0.75	67.5
24 *	0.031	0.325	90	57	0.031	0.55	135	90	0.033	0.80	180
25	0.032	0.35	180	58	0.031	0.55	112.5	91	0.033	0.80	157.5
26	0.032	0.35	135	59 *	0.031	0.55	90	92	0.032	0.80	135
27	0.031	0.35	112.5	60	0.032	0.575	180	93 *	0.032	0.80	112.5
28	0.031	0.35	90	61	0.032	0.60	180	94	0.031	0.80	90
29 *	0.031	0.35	67.5	62	0.033	0.60	157.5	95 *	0.030	0.80	67.5
30	0.034	0.375	180	63	0.031	0.60	135	96 *	0.029	0.80	45
31	0.032	0.375	135	64	0.031	0.60	112.5	97 *	0.030	0.80	0
32	0.033	0.40	180	65	0.031	0.60	90	98	0.033	0.85	180
33	0.032	0.40	157.5	66	0.031	0.60	67.5	99	0.032	0.85	157.5
								100	0.032	0.85	135
								101 *	0.030	0.85	112.5
								102 *	0.030	0.85	90
								103	0.030	0.90	180
								104	0.033	0.90	157.5
								105	0.032	0.90	135
								106 *	0.032	0.90	112.5
								107	0.031	0.90	90
								108 *	0.030	0.90	67.5
								109 *	0.029	0.90	45
								110 *	0.033	0.935	180
								111 *	0.033	0.974	180

\* Data were not obtained at these T/C locations.

TABLE VI  
RUN NUMBER/TUNNEL CONDITION SUMMARY

Run No.	Config $O_1 + T_1$	$\alpha_m$ , deg.	$\alpha_{strut}$ , deg.	$\beta$	Const Set**	$M_\infty$	Nominal***		
							$Re_\infty$ /ft $\times 10^{-6}$	$P_t$ psia	$T_t$ or 1500
1	$O_1$	0	0	0	100	5.22	1.0	100	
2		0	0		200				
3		30	-10.0		200				
4		60	20.0		200				
5		60	20.0		100				
6		60	20.0		100	5.3	4.0	410	
7		30	-10.0		100	5.22	1.0	100	
8		*	*	-5	100				
9		*	*	-5	200				
10		30	-10.0	0	200	5.3	4.0	410	
11		30	-10.0		100				
12		60	20.0		200				
13		-60	-20.0		200				
14		-60	-20.0		200	5.22	1.0	100	
15		-30	10.0		100				
16		-30	10.0		200				
17		90	-10.0		200				
18		90	-10.0		100				
19		120	20.0		100				
20		120	20.0		200				
21		-120	20.0		200				
22		-120	20.0		100				
23		-90	-10.0		100				
24		-90	-10.0		200				
25		-90	-10.0		100				
26		-120	20.0		100				

\*  $\alpha_m = 30^\circ 22' 32''$ ,  $\alpha_{strut} = -9^\circ 37' 28''$

\*\* 100 - Orbiter T/Cs; 200 - External Tank T/Cs

\*\*\* Actual test values are given in the Appendix

TABLE VI  
RUN NUMBER/TUNNEL CONDITION SUMMARY (Concluded)

Run No.	Config	$\alpha$ π, deg.	$\alpha$ strut, deg.	$\beta$	Const Set**	$M_\infty$	Nominal***		
							$Re_\infty / \rho t$ $\times 10^{-6}$	$P_t$ psia	$T_t$ OR
27	O <sub>1</sub>	120	20.0	0	100	5.22	1.0	100	1500
28	T <sub>1</sub>	90	-10.0		100				
29		-60	-20.0		100				
30		-30	10.0		100				
31	T <sub>1</sub>	-30	10.0		200				
32		-60	-20.0		200				
33		0	0		200				
34	O <sub>1</sub>	0	0		100				
35		30	-10.0		100				
36		60	20.0		100				
37	T <sub>1</sub>	-90	-10.0		200				
38		-120	20.0		200				
39		-90	-10.0		200	5.3	4.0	410	

\*\* 100 - Orbiter T/Cs; 200 - External Tank T/Cs

\*\*\* Actual test values are given in the Appendix

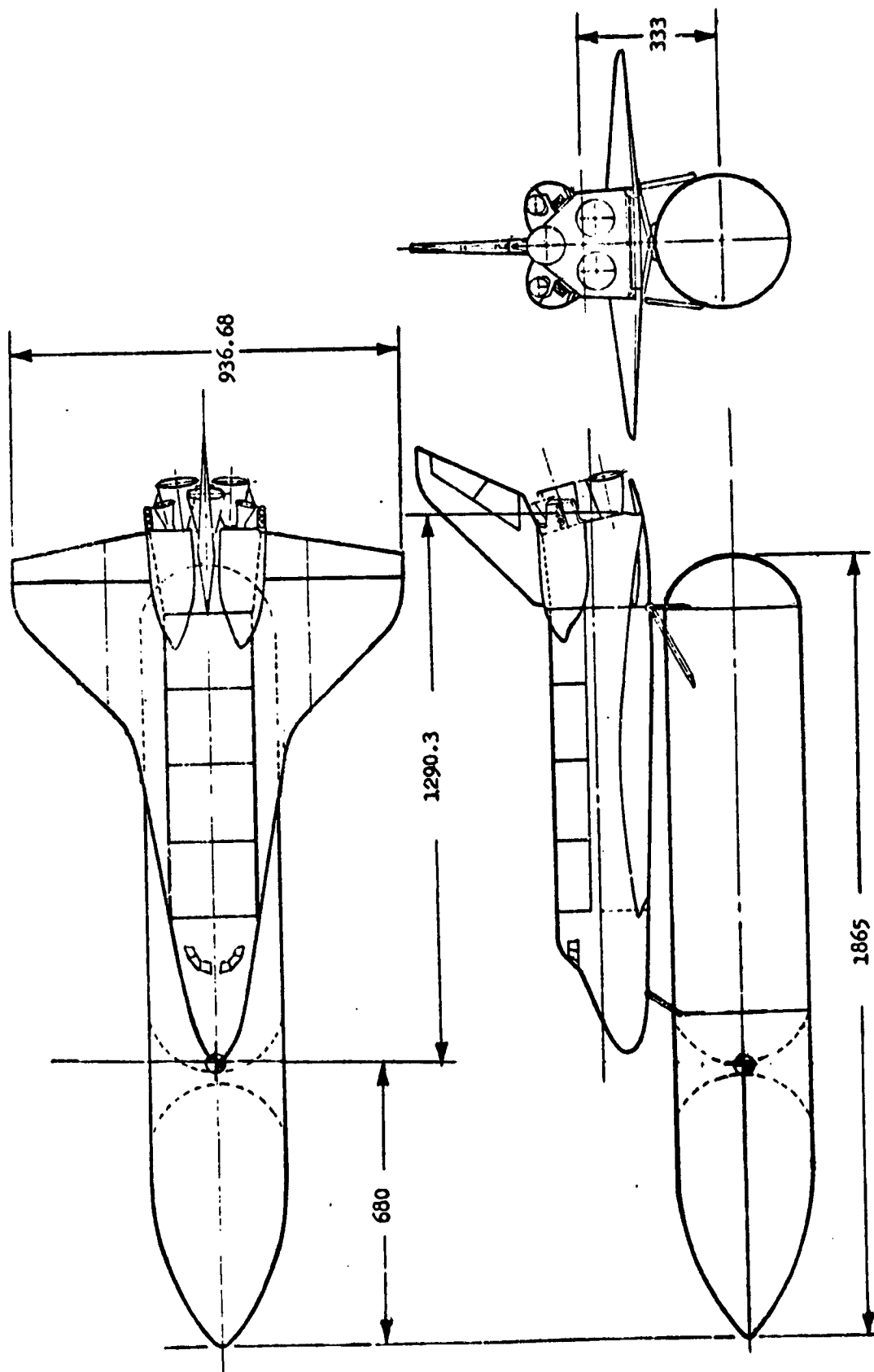
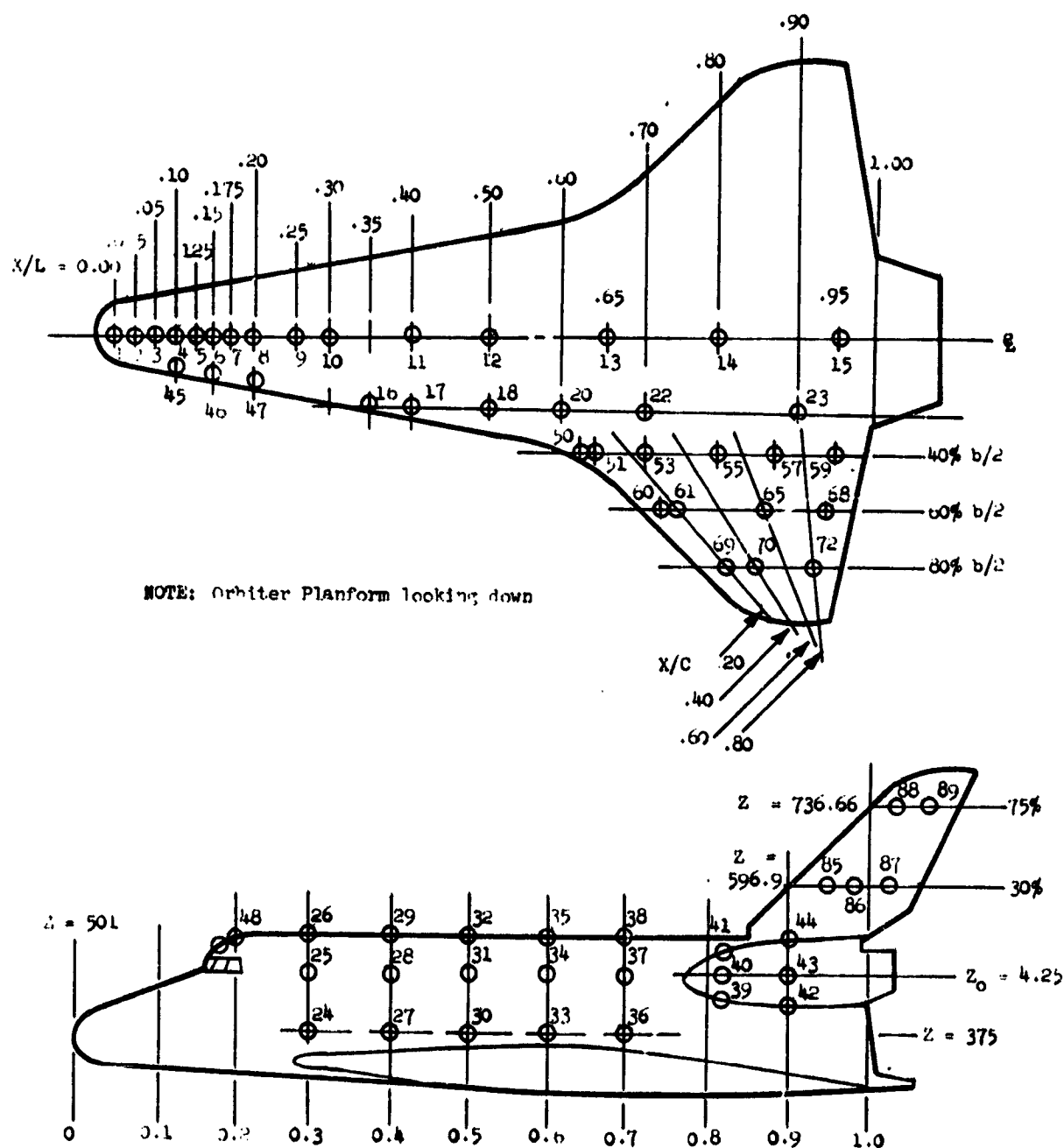
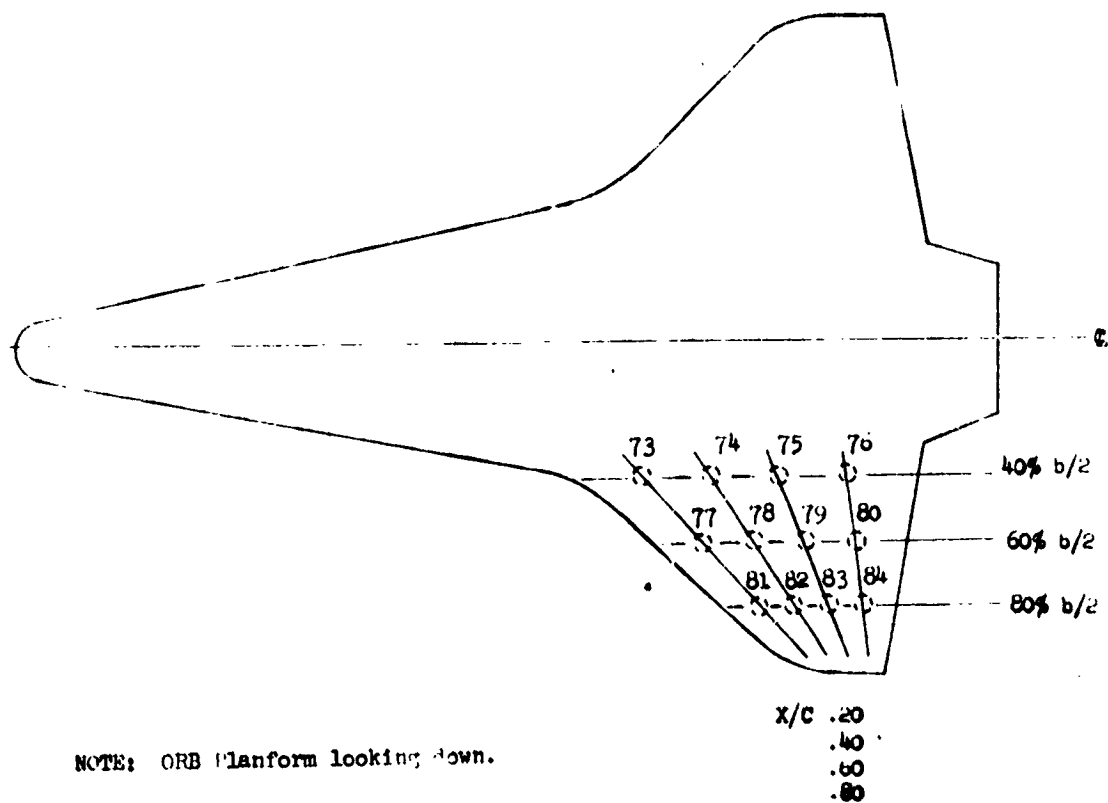


Figure 1. Orbiter/External Tank General Layout



a. 50-0 Orbiter -- 147-B Configuration Thermocouple Locations  
Figure 2. Model Instrumentation Sketches

# Upper Surface (Left Wing ) Instrumentation



NOTE: ORB Planform looking down.

- a. 50-0 Orbiter -- 147-B Configuration Thermocouple Locations  
Figure 2. Model Instrumentation Sketches (Concluded).

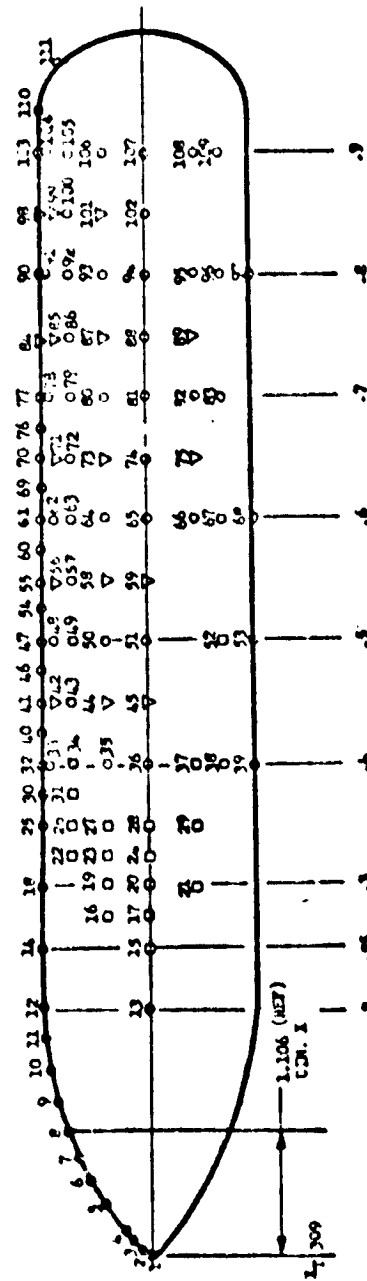
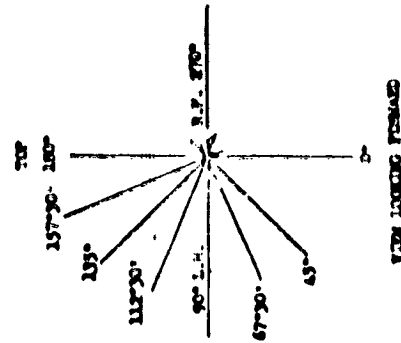
T/C NO.	DIR. I	$\phi$
1	0	180°
2	1.055	180°
3	1.221	180°
4	1.387	180°
5	1.553	180°
6	1.719	180°
7	1.885	180°
8	2.051	180°
9	2.217	180°
10	2.383	180°
11	2.549	180°
12	2.715	180°
13	2.881	180°
14	3.047	180°
15	3.213	180°
16	3.379	180°
17	3.545	180°
18	3.711	180°
19	3.877	180°
20	4.043	180°
21	4.209	180°
22	4.375	180°
23	4.541	180°
24	4.707	180°
25	4.873	180°

T/C NO.	DIR. I	$\phi$
26	5.039	180°
27	5.205	180°
28	5.371	180°
29	5.537	180°
30	5.703	180°
31	5.869	180°
32	6.035	180°
33	6.201	180°
34	6.367	180°
35	6.533	180°
36	6.699	180°
37	6.865	180°
38	7.031	180°
39	7.197	180°
40	7.363	180°
41	7.529	180°
42	7.695	180°
43	7.861	180°
44	8.027	180°
45	8.193	180°
46	8.359	180°
47	8.525	180°
48	8.691	180°
49	8.857	180°
50	9.023	180°

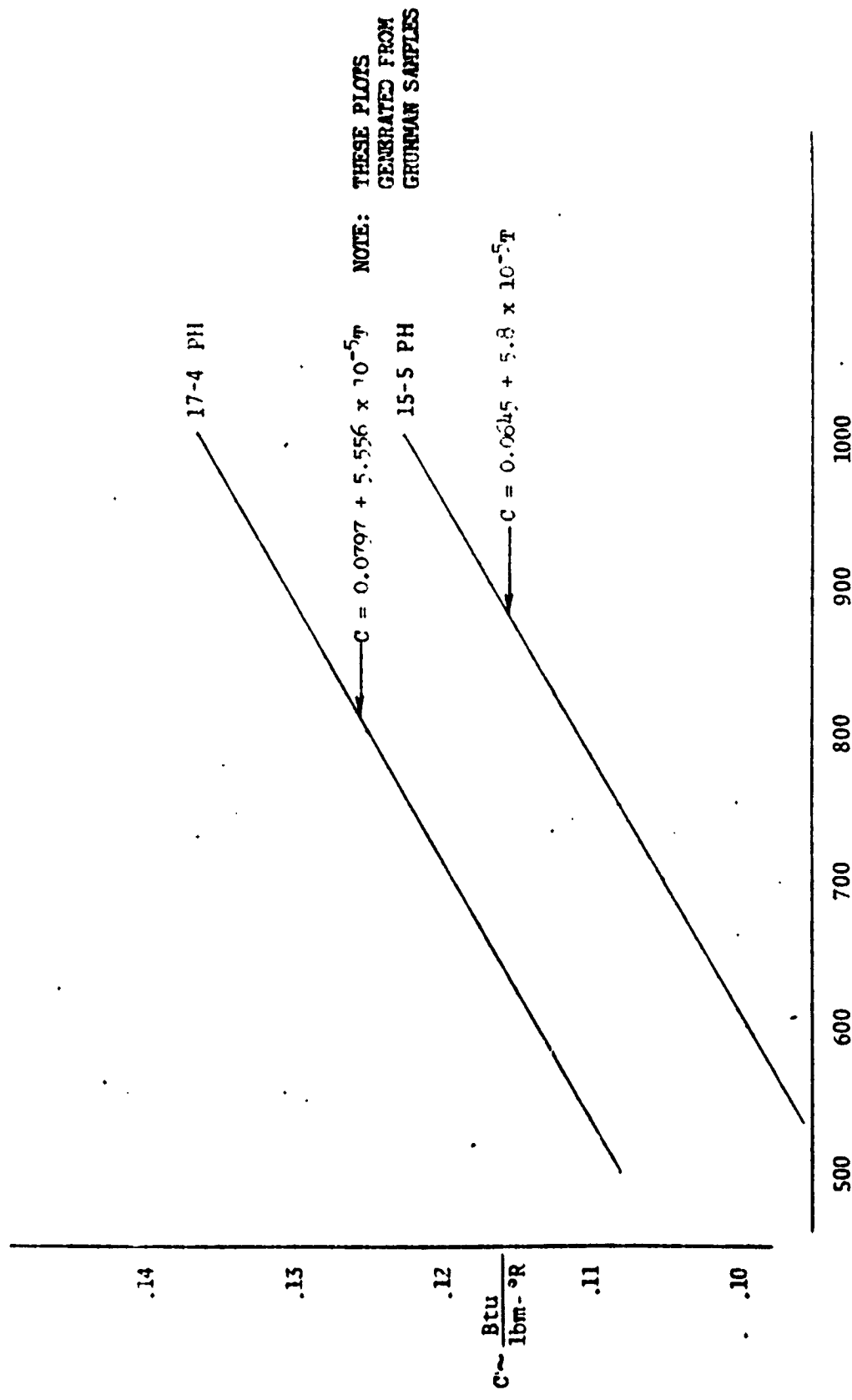
T/C NO.	DIR. I	$\phi$
51	9.189	180°
52	9.355	180°
53	9.521	180°
54	9.687	180°
55	9.853	180°
56	10.019	180°
57	10.185	180°
58	10.351	180°
59	10.517	180°
60	10.683	180°
61	10.849	180°
62	11.015	180°
63	11.181	180°
64	11.347	180°
65	11.513	180°
66	11.679	180°
67	11.845	180°
68	12.011	180°
69	12.177	180°
70	12.343	180°
71	12.509	180°
72	12.675	180°
73	12.841	180°
74	13.007	180°
75	13.173	180°

T/C NO.	DIR. I	$\phi$
76	13.339	180°
77	13.505	180°
78	13.671	180°
79	13.837	180°
80	14.003	180°
81	14.169	180°
82	14.335	180°
83	14.501	180°
84	14.667	180°
85	14.833	180°
86	15.000	180°
87	15.166	180°
88	15.332	180°
89	15.498	180°
90	15.664	180°
91	15.830	180°
92	16.000	180°
93	16.166	180°
94	16.332	180°
95	16.498	180°
96	16.664	180°
97	16.830	180°
98	17.000	180°
99	17.166	180°
100	17.332	180°

T/C NO.	DIR. I	$\phi$
101	17.500	180°
102	17.666	180°
103	17.832	180°
104	18.000	180°
105	18.166	180°
106	18.332	180°
107	18.500	180°
108	18.666	180°
109	18.832	180°
110	19.000	180°
111	19.166	180°
112	19.332	180°
113	19.500	180°
114	19.666	180°
115	19.832	180°
116	20.000	180°
117	20.166	180°
118	20.332	180°
119	20.500	180°
120	20.666	180°



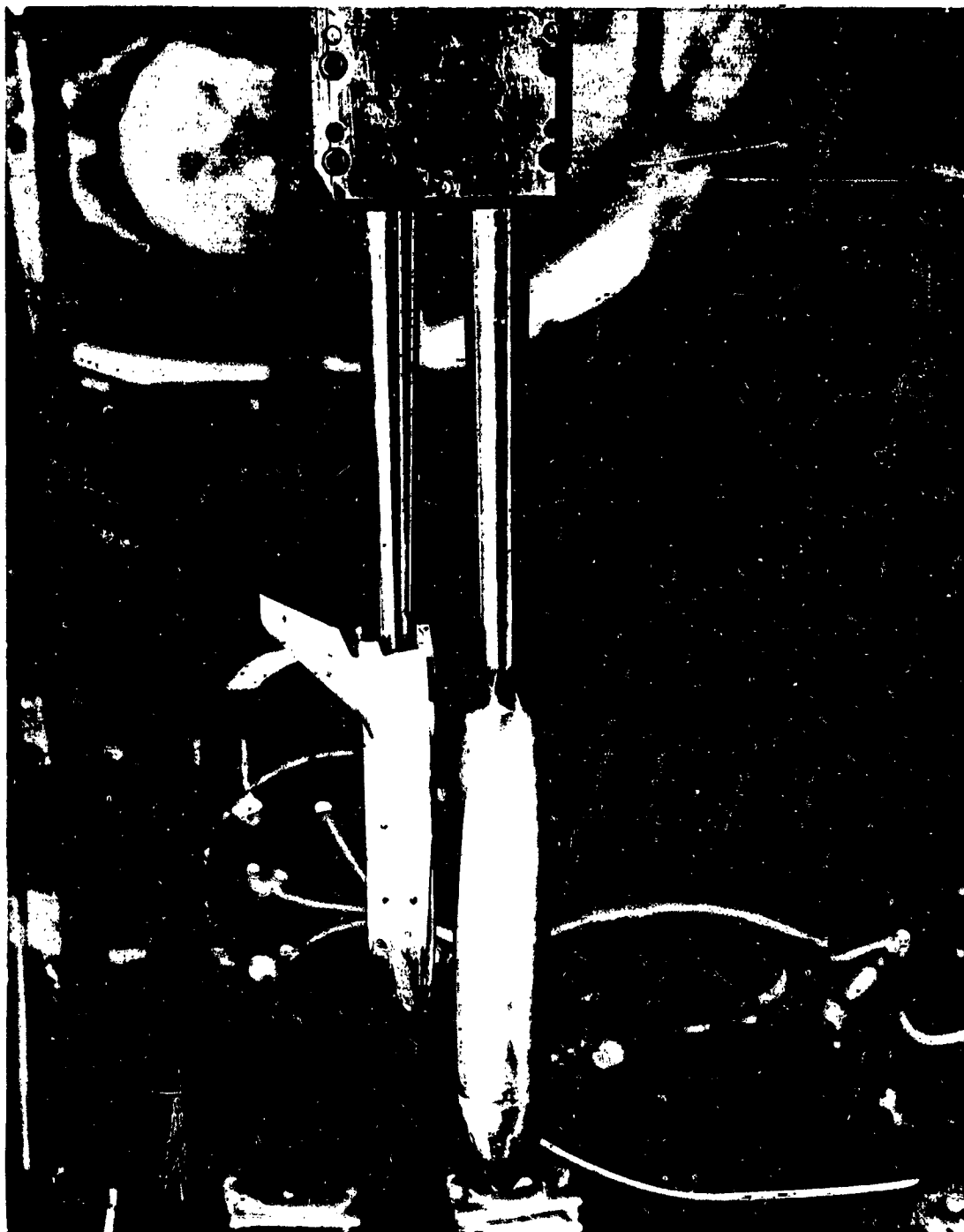
b. 41-T 0.000-Scale External Tank T/C Locations  
Figure 2. Model Instrumentation Sketches



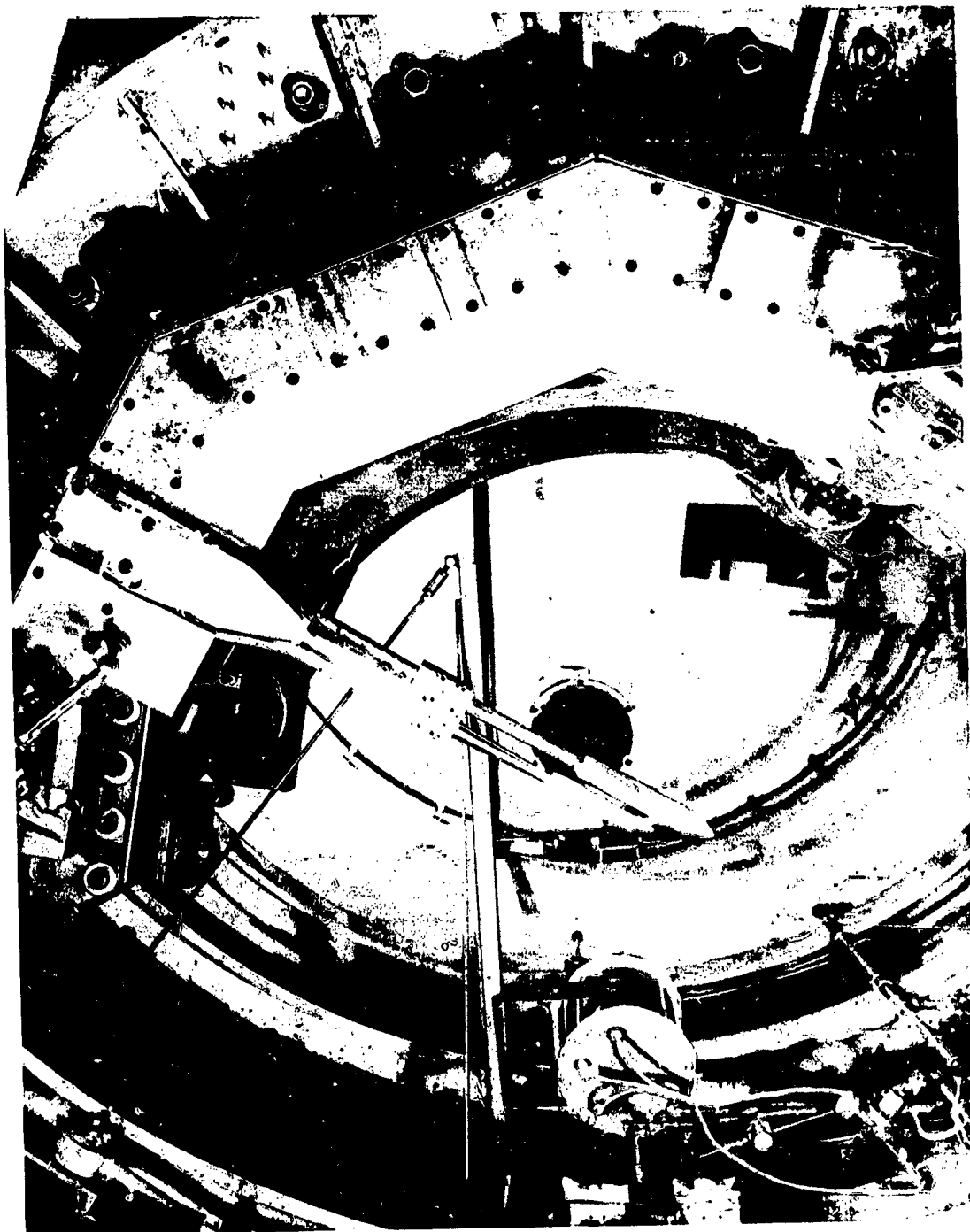
c. Specific Heat vs. Temperature for 17-4PH and 15-5PH stainless steel

Figure 2. Model Instrumentation Sketches

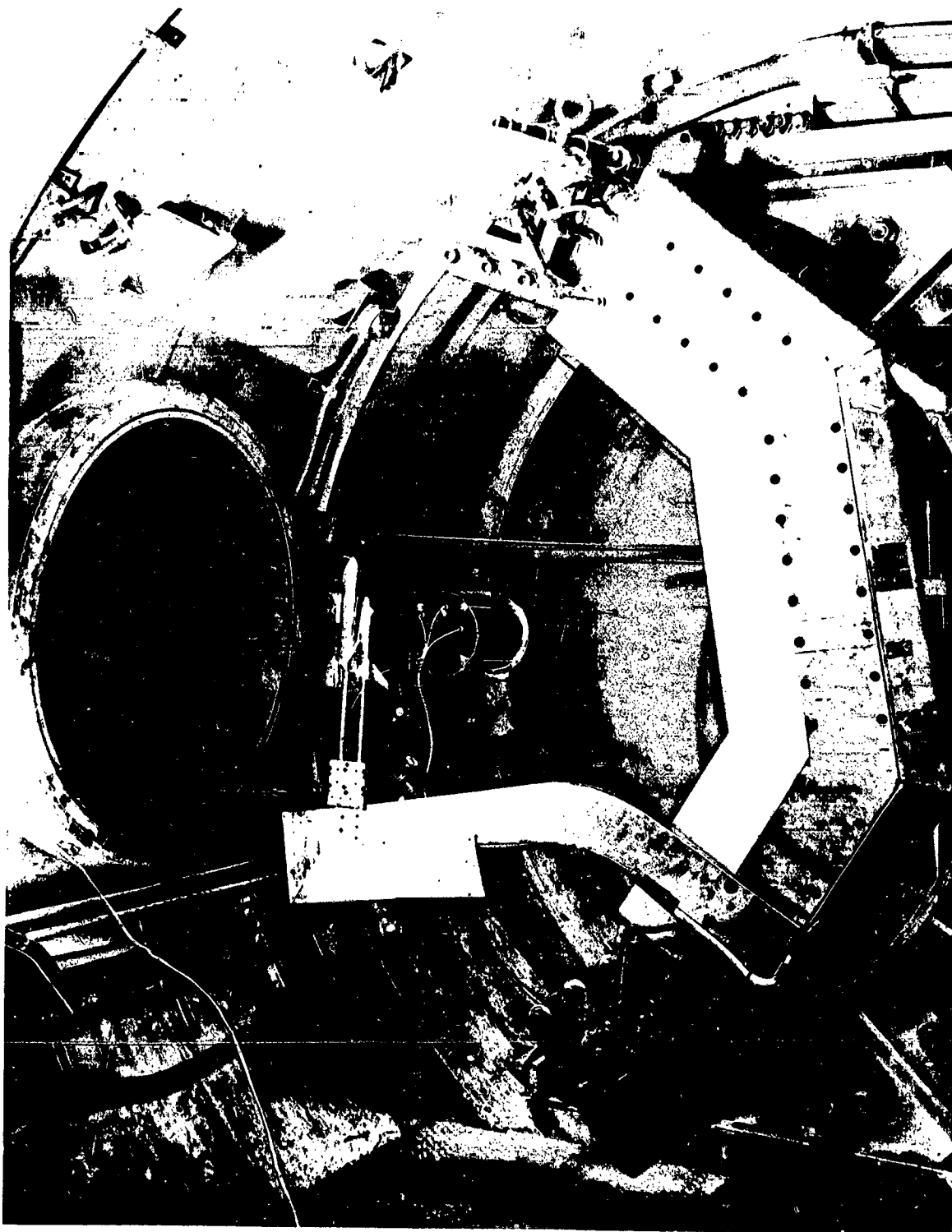




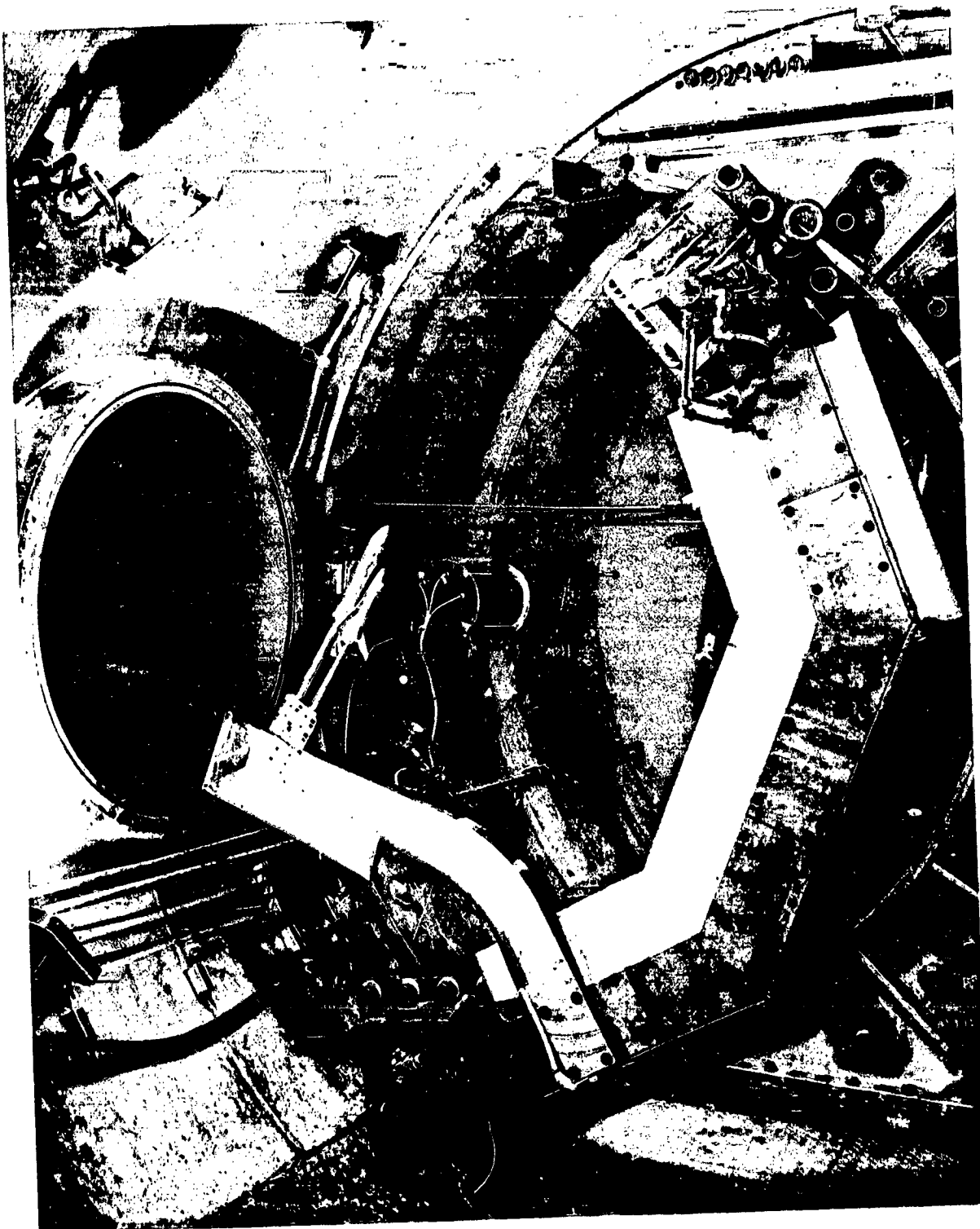
a. Orbiter/Tank at 0.0 degrees  
Figure 3. Model Installation Photographs



b. Orbiter/Tank at -60.0 degrees  
Figure 3. Model Installation Photographs



c. Orbiter/Tank at 90.0 degrees  
Figure 3. Model Installation Photographs



d. Orbiter/Tank at 120.0 degrees  
Figure 3. Model Installation Photographs

DATA FIGURES

Volume 1 - Figures 4-15

Volume 2 - Figures 16-27

AMES 3.5-1.95 H28 T1      EXTERNAL TANK      (REV T13)  
 SUBC    HAN/HT    PWT    MACH    PARAMETRIC VALUES  
          .850    20.000    5.220    .000    BETA    .000  
          .900                                   1.000  
          1.000

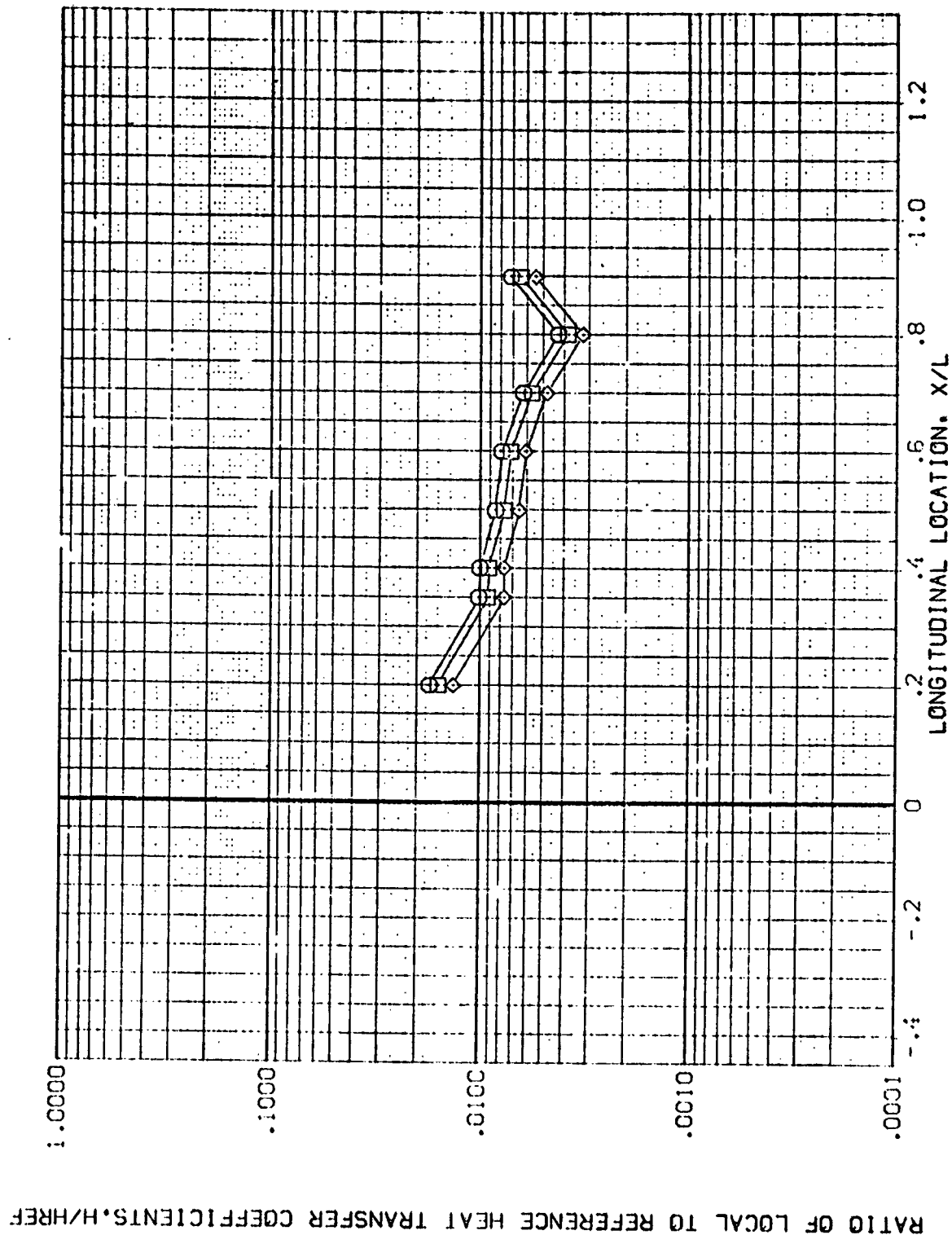


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

SYMBOL

HAW/HT

PHI

MACH

.850

112.500

5.220

.900

1.000

1.000

ALPHA

RN/L

PARAMETRIC VALUES

.000

BETA

1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

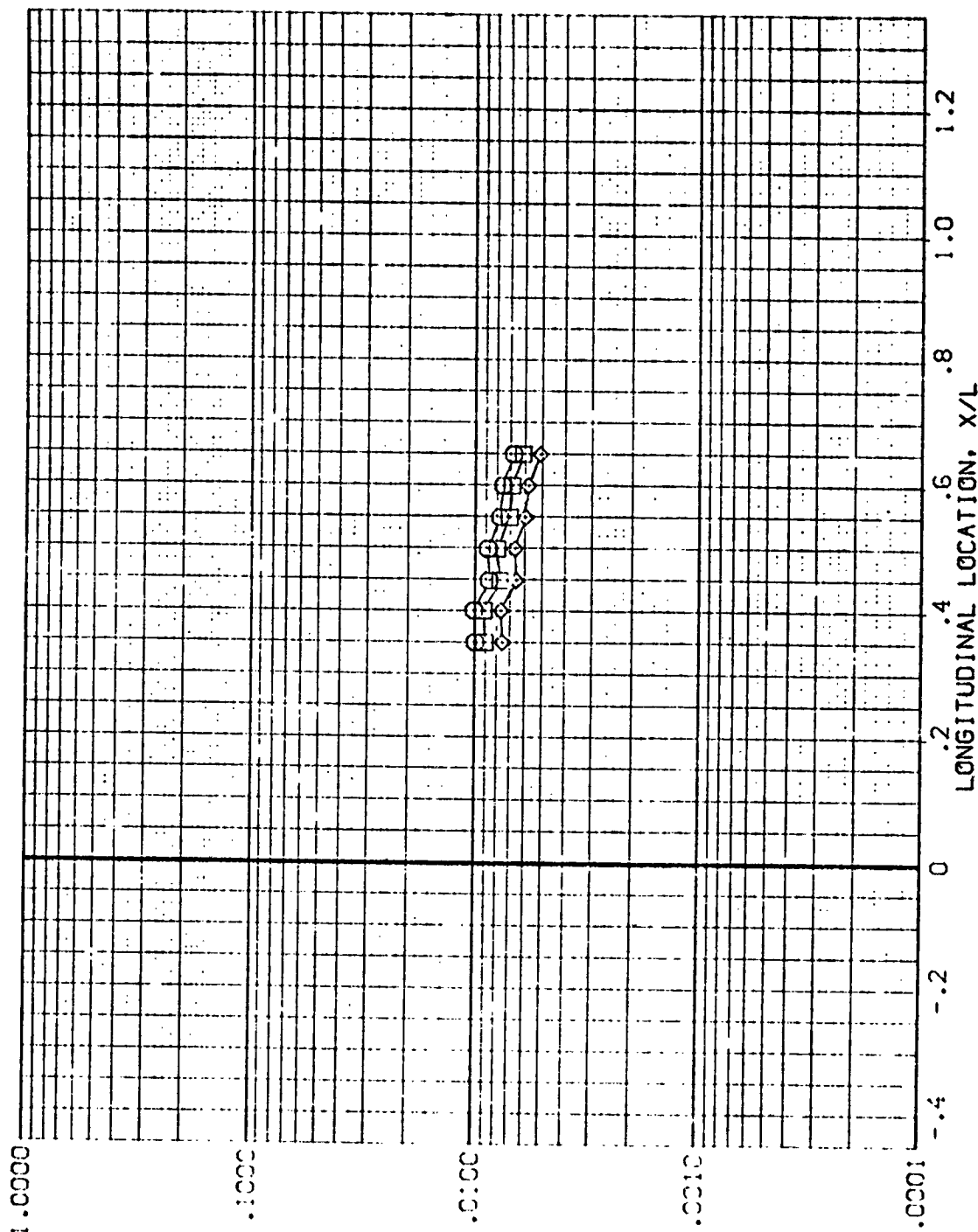


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1      EXTERNAL TANK      (REV113)

SVES2	WAB/WT	P-1	WACH	PARAMETRIC VALUES
	.650	135.000	5.220	ALPHA
	.900			FN/L
	1.000			BETA
				.000

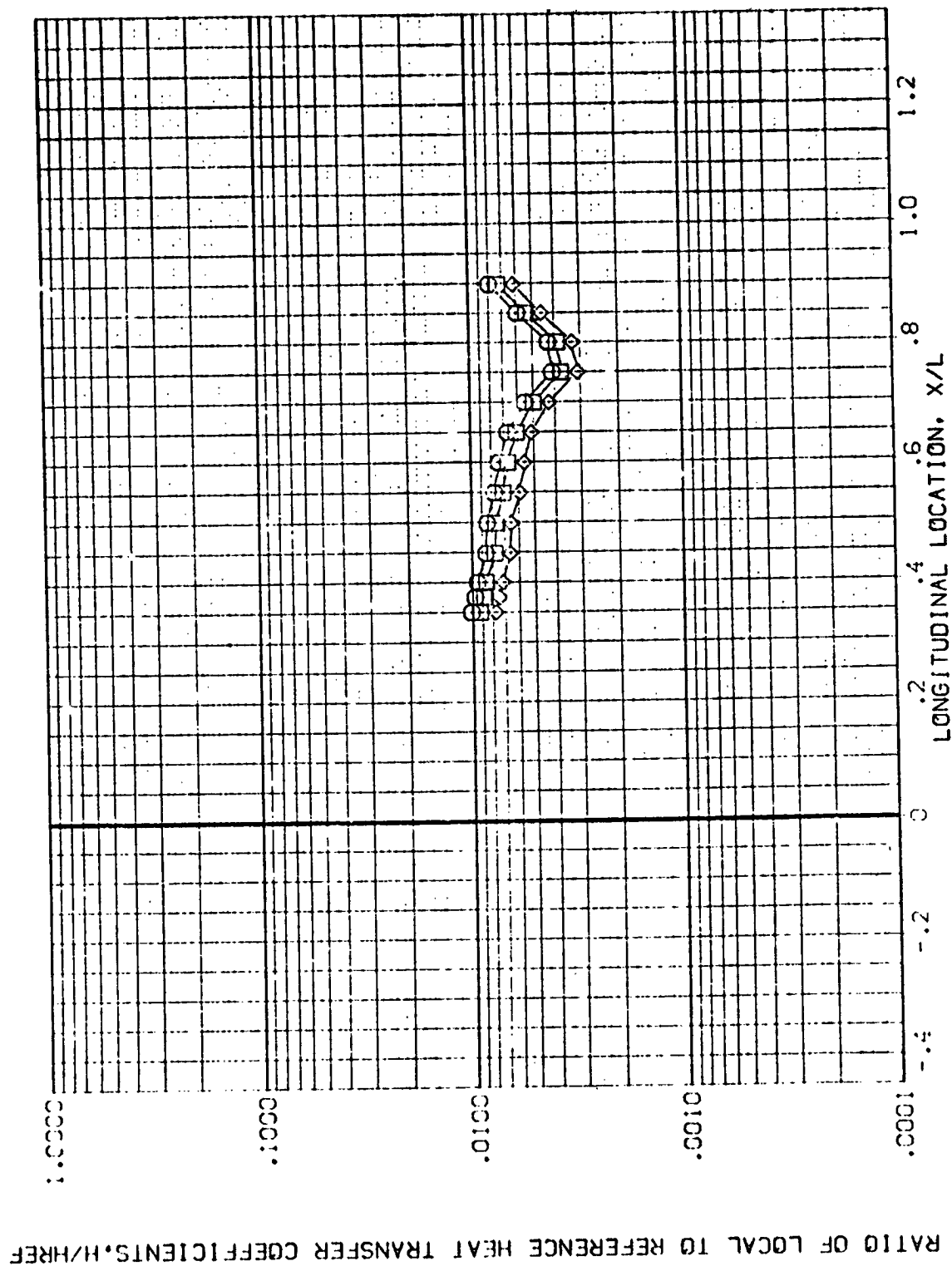


FIG. 4 TANK, ALONE



(REV113)

EXTERNAL TANK

AVES 3.5-.95 IH28 T1

SYMBOL HAW/H-T PH1 MACH  
 ○ .850  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA .000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

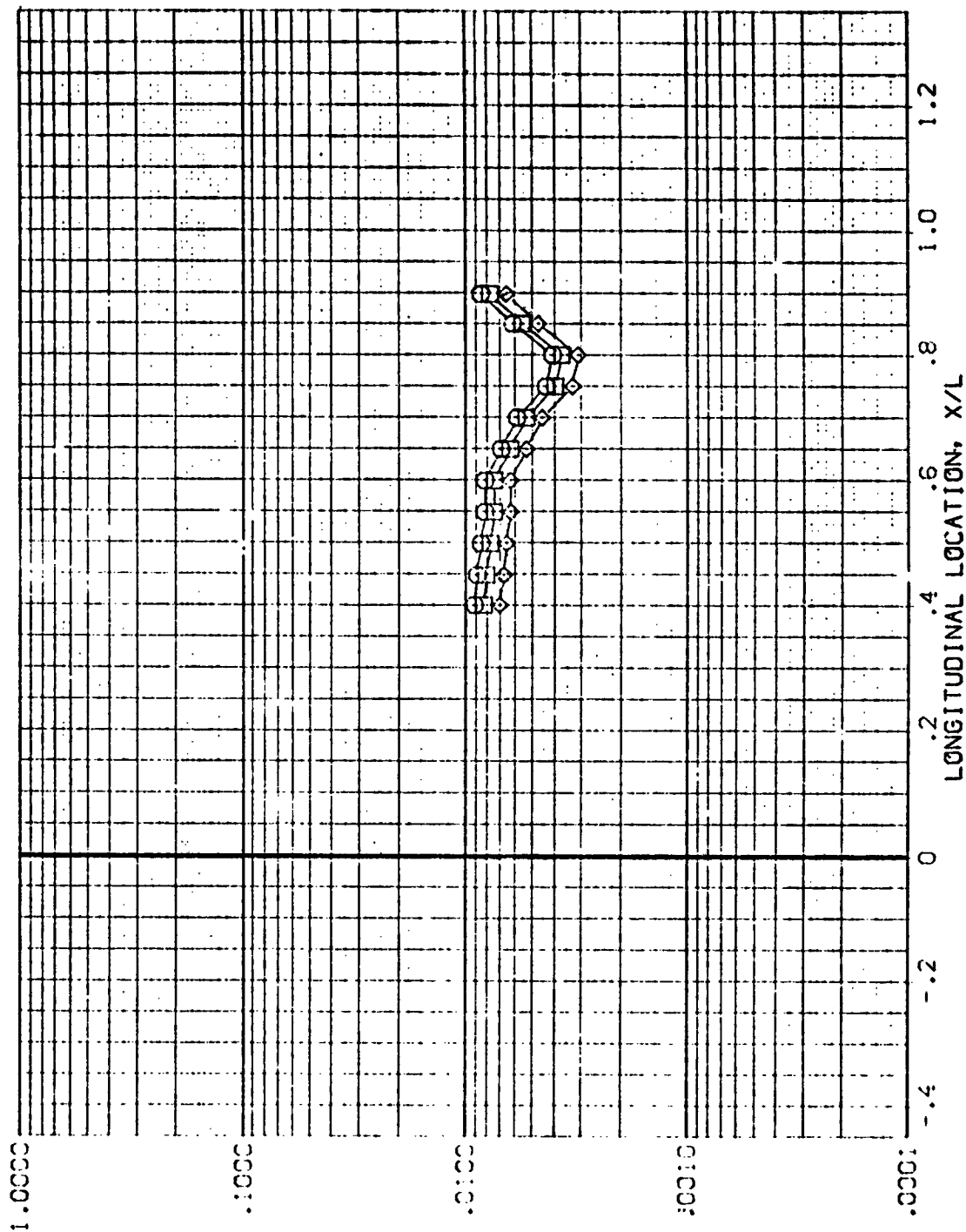


FIG. 4 TANK, ALONE

AYES 3.5-195 IH28 T1      EXTERNAL TANK      (REV T13)  
 PARAMETRIC VALUES  
 ALPHA      BETA  
 RN/L      1.000      .000  
 .000  
 .000  
 .000  
 .000

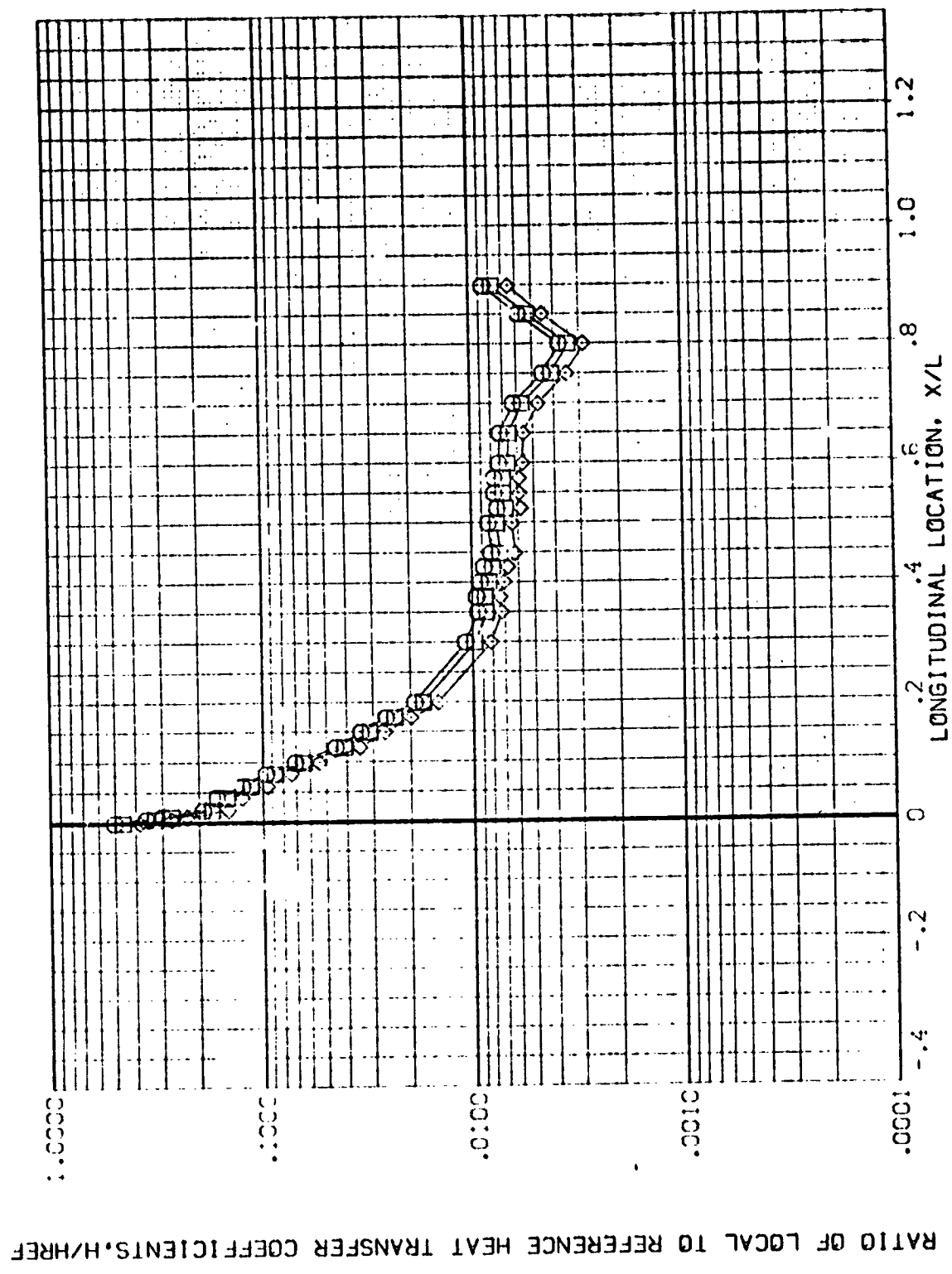


FIG. 4 TANK, ALONE

# AVES 3.5-195 IH28 T1 EXTERNAL TANK (REV114)

SYMBOL

WAVELENGTH  
90.000  
5.220  
1.000

PARAMETER VALUES  
A, B, C  
-30.000 BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

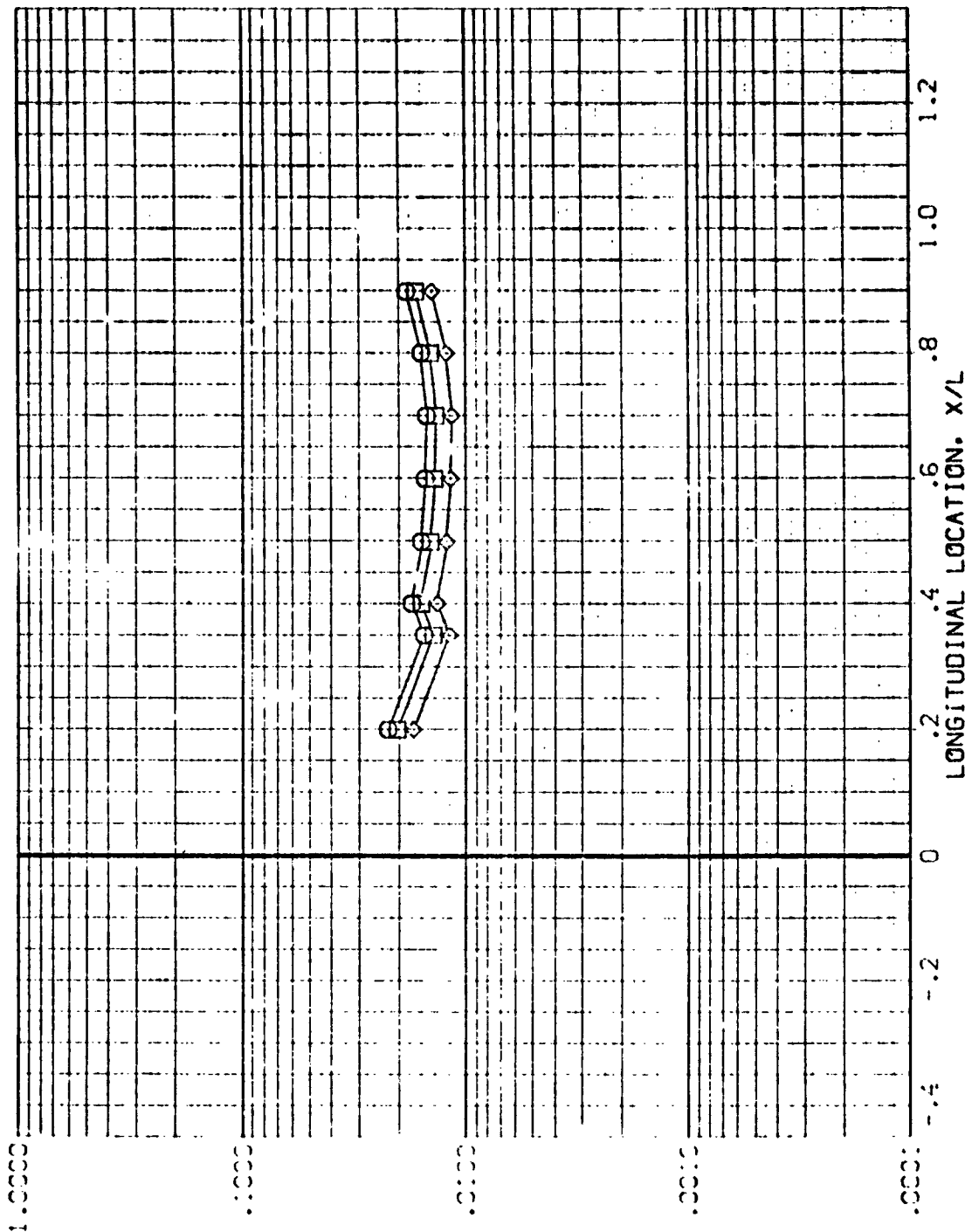


FIG. 4 TANK, ALONE

AYES 3.5-195 1428 T1      EXTERNAL TANK      (REV114)  
 PARAMETRIC VALUES  
 ALPHA      -30.000      BETA      .000  
 RAYL      1.000

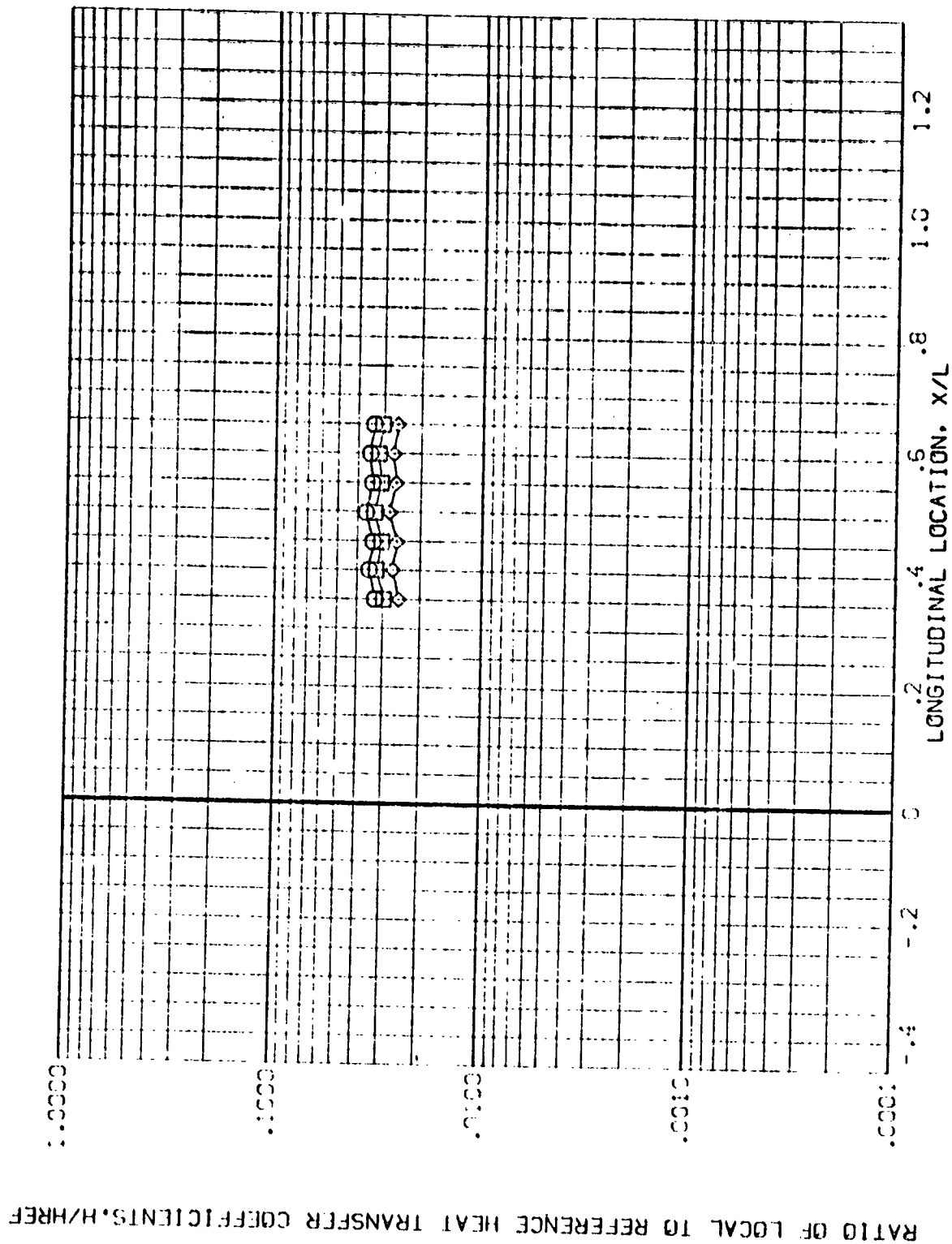


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV14)

SYMBOL: H/W/L" P/L" WACH  
 .850 135.000 5.220  
 .930  
 1.000

PASSED: VALUES  
 ALENA  
 P/L 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

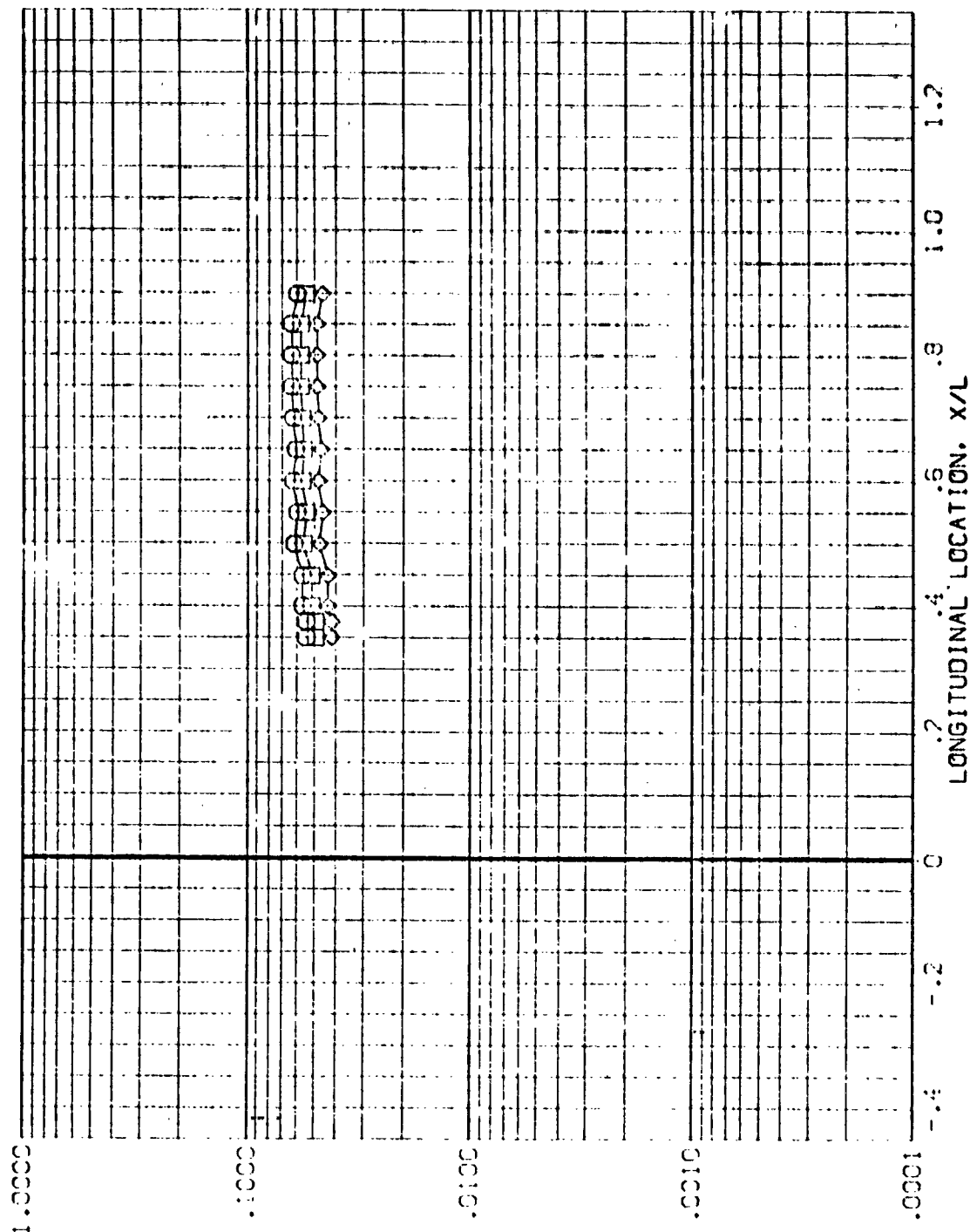


FIG. 4 TANK, ALONE

(REV114)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
-30.000 BETA .000  
1.000

ALPHA  
RN/L

SYMBOLS  
HAW/UT P-H MACH  
.850 157.500 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

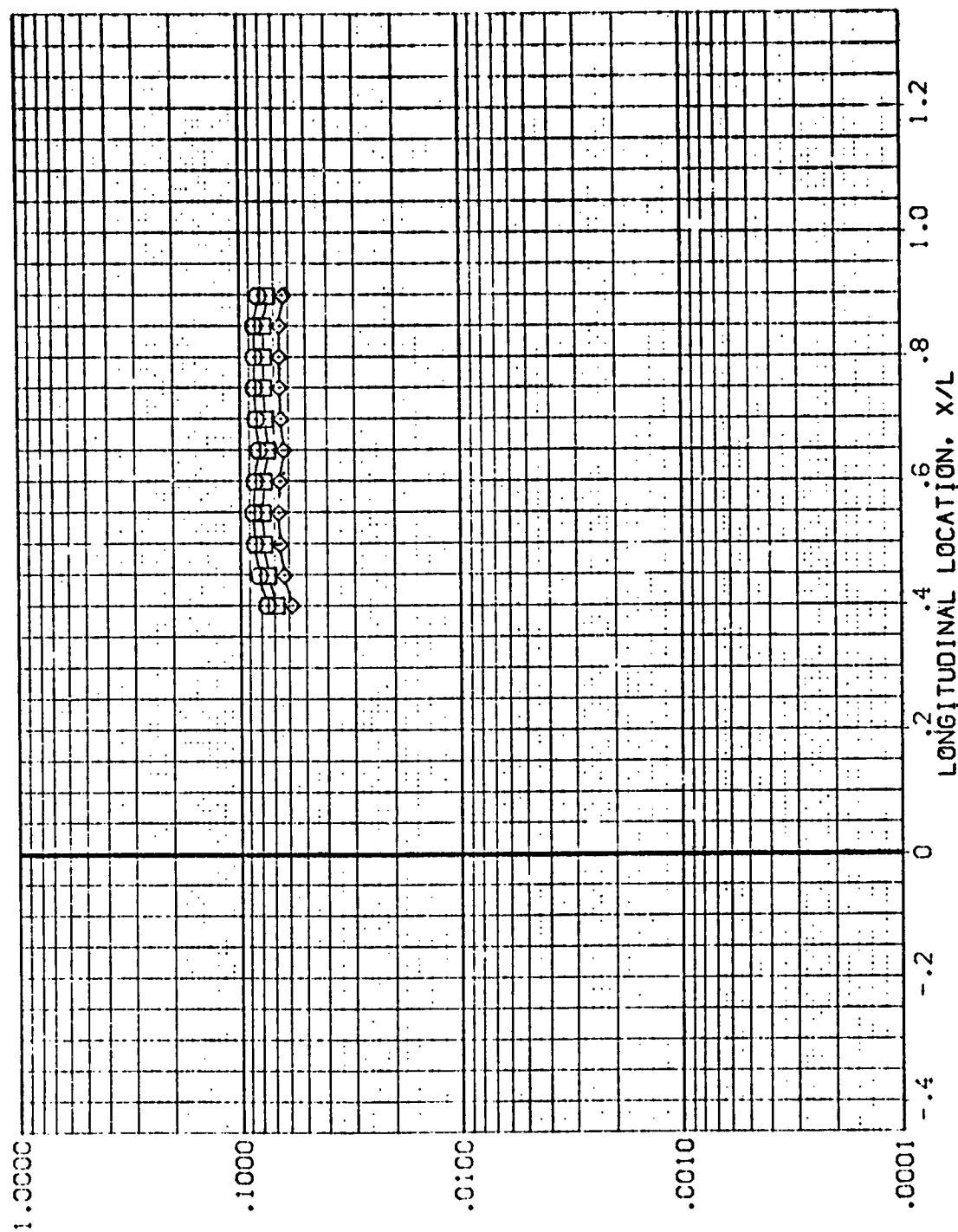


FIG. 4 TANK, ALONE

(REV114)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYMBOL

HAU/HT  
.850  
.900  
1.000

PHI  
180.000

MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
RN/L  
-30.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

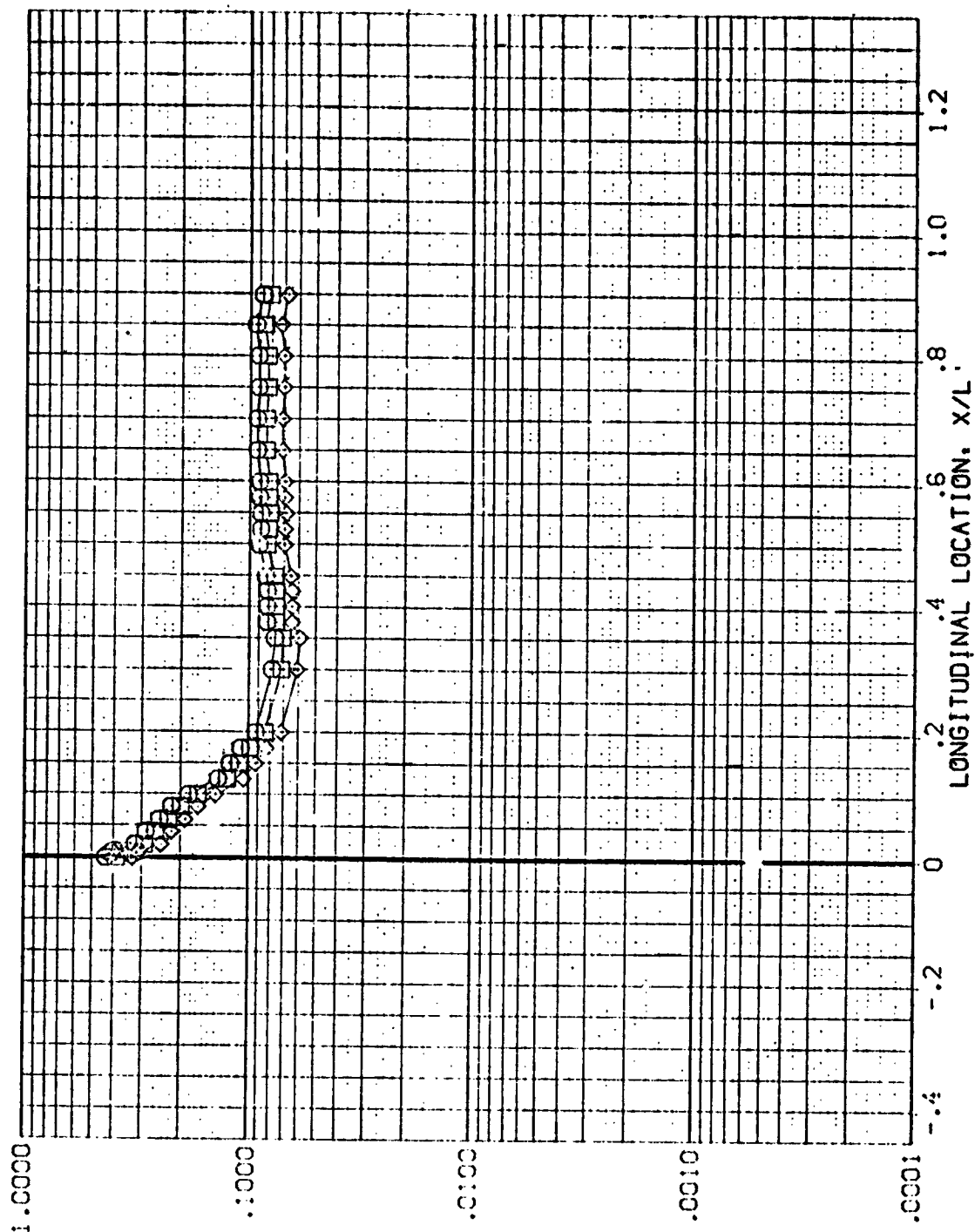


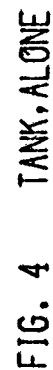
FIG. 4 TANK, ALONE





RAW/WT	PFI	MACH
.850	112.500	5.221
.900		
1.000		

PARAMETRIC VALUES	
ALPHA	-60.000
BETA	1.000
RN/L	.000



# AXES 3.5-195 IH28 T1 EXTERNAL TANK

(REV115)

SYMBOL

HAIR/MT .950  
PHI 135.000  
MACH 5.221

PARAMETRIC VALUES

ALPHA RN/L  
-60.000 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

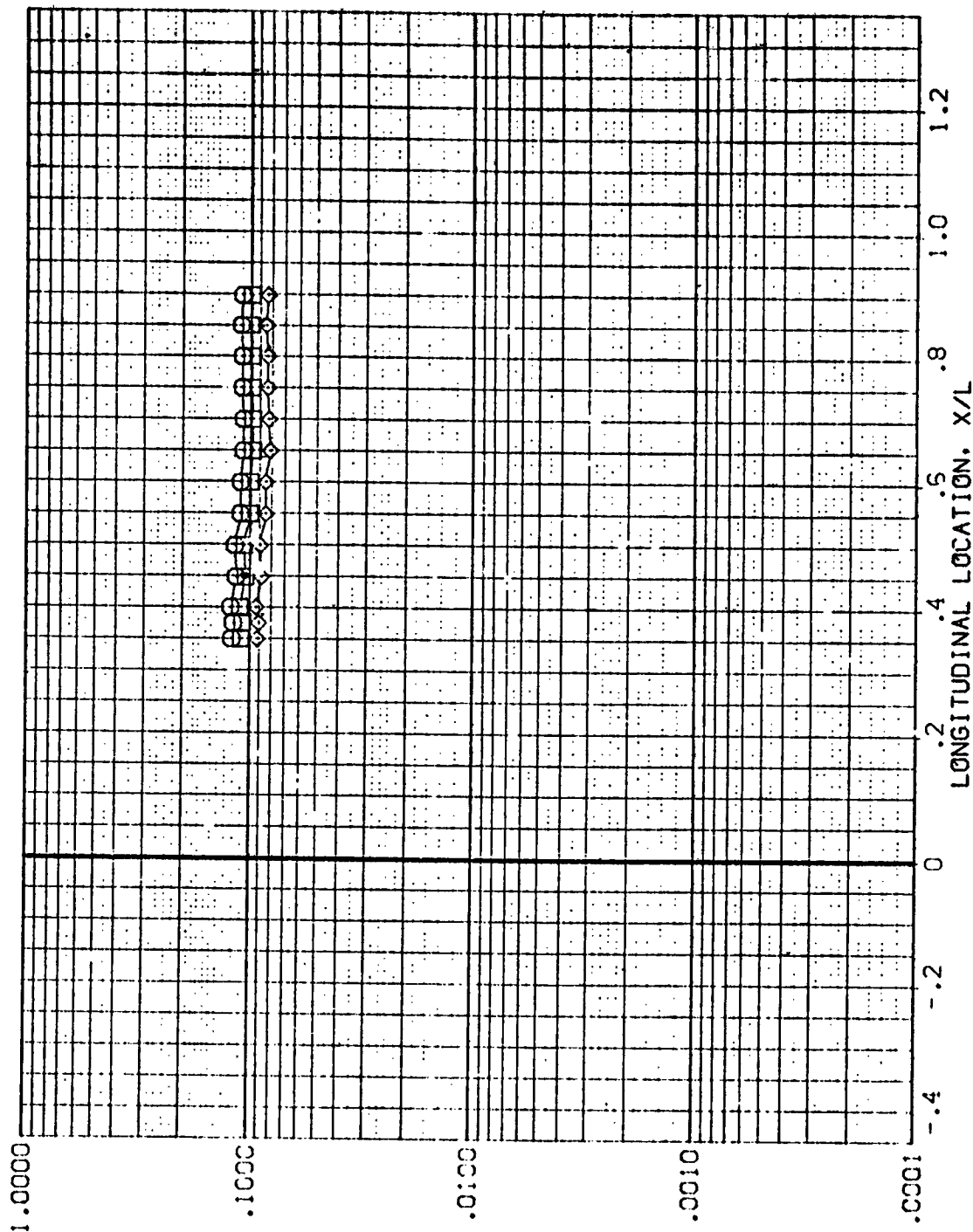


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV115)

SYMBOL

WAVELENGTH  
.850  
.900  
1.000

PHI  
157.500

MACH  
5.221

PARAMETRIC VALUES

ALPHA  
RN/L

BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

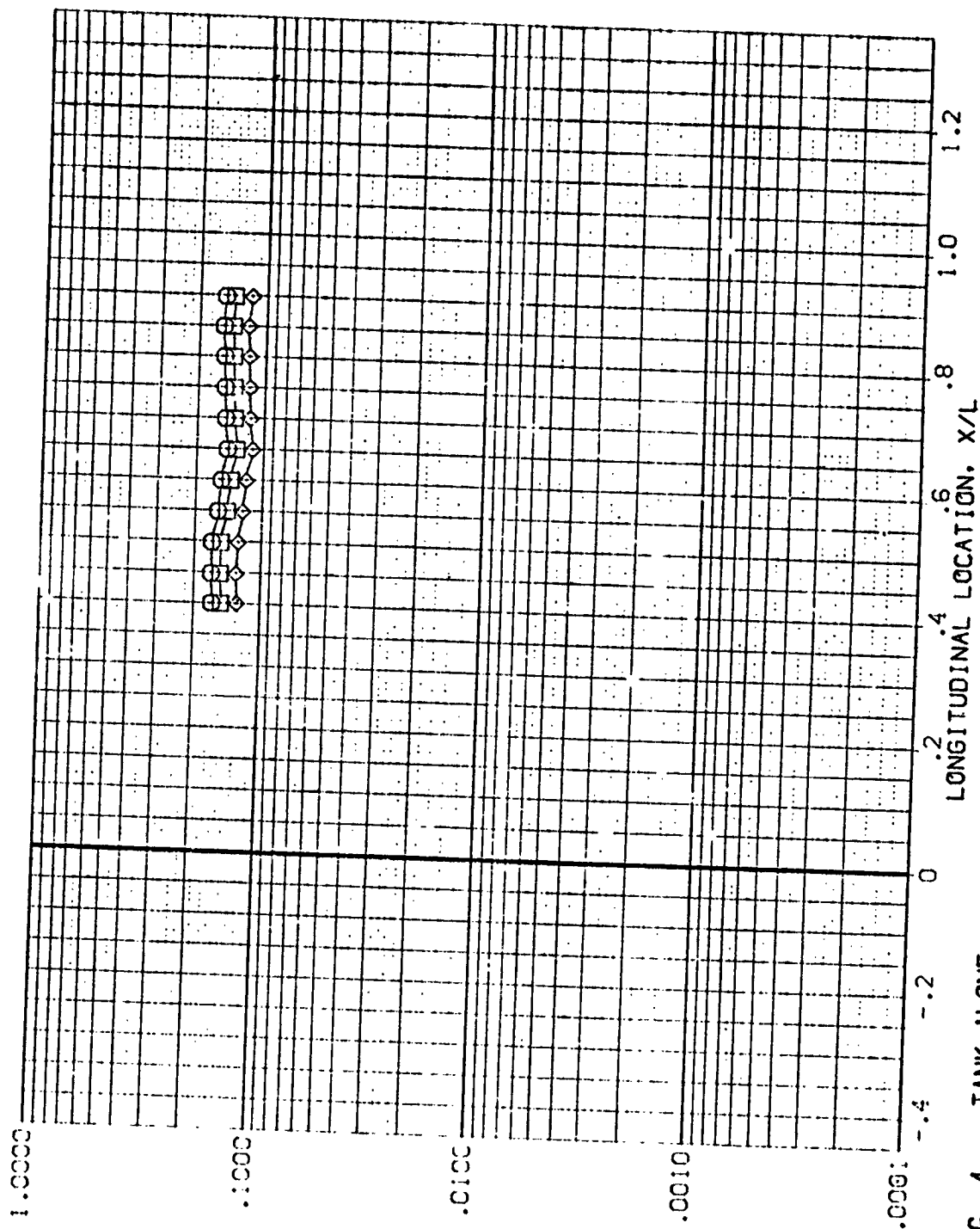


FIG. 4 TANK ALONE

AXES 3.5-195 IH28 T1      EXTERNAL TANK      (REV T15)  
 SYMBC.    HAW/HT    P-1    MACH    PARAMETRIC VALUES  
              .850    180.000    5.221    -60.000    BETA    .000  
              .900                                1.000    ALPHA  
              1.000                                              RH/L

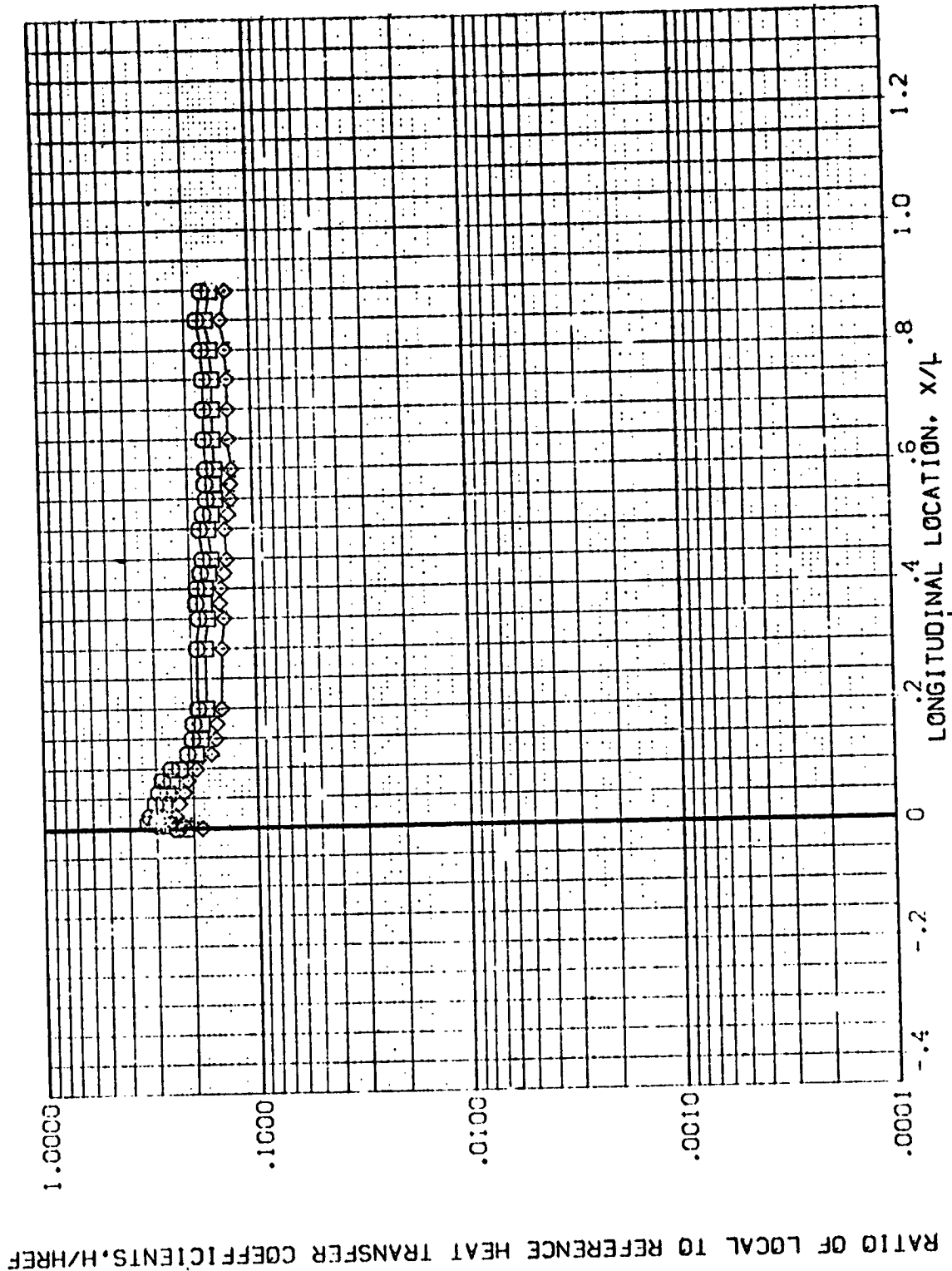


FIG. 4 TANK ALONE

(REV T16)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 PN/L 1.000

SWING WING/HT PHI MACH  
 .850 90.000 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

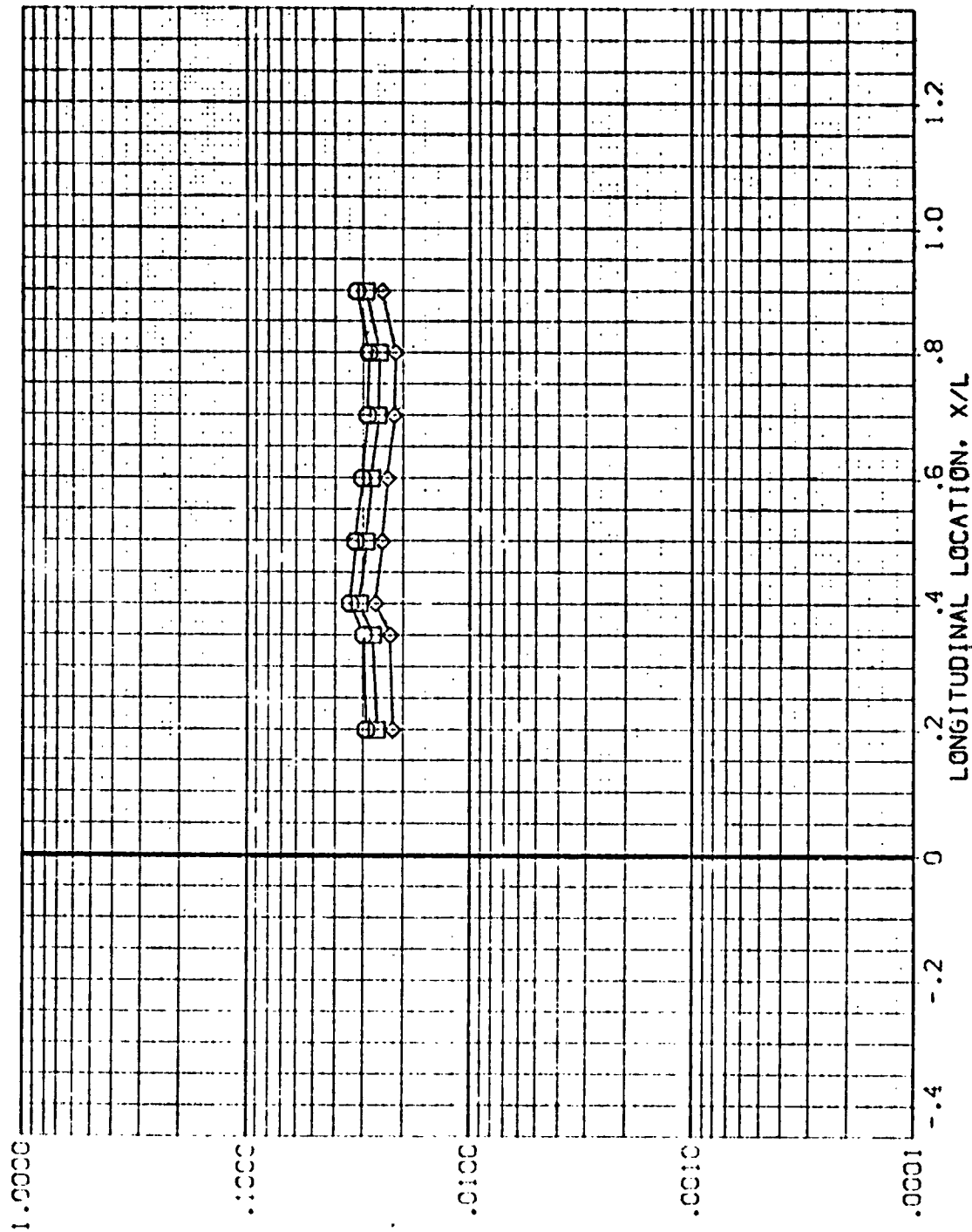


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV116)

SWEET- HAN/UT P-1: MACH  
 .850 112.500 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

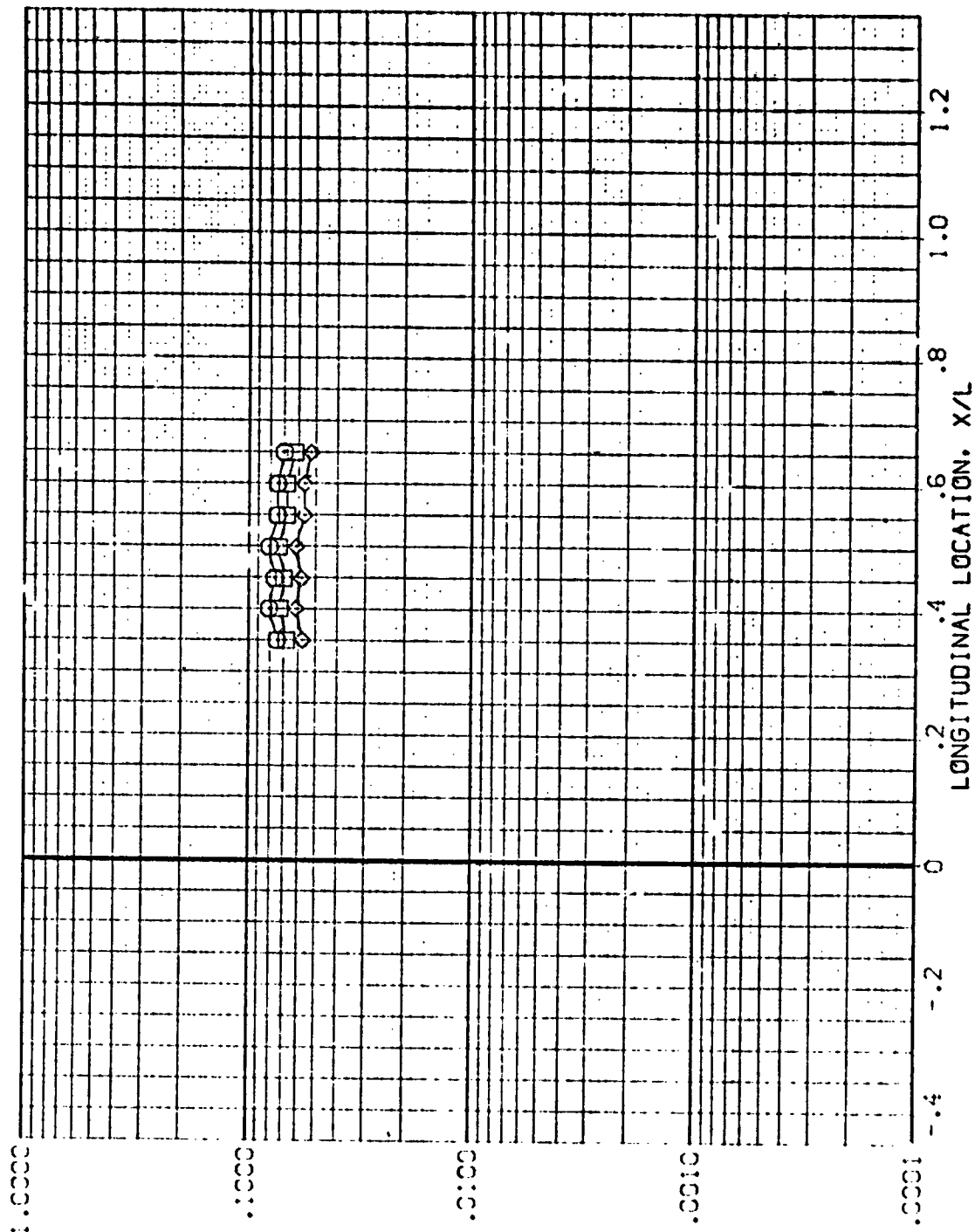


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV116)

SYMBOL

HAIR/HT .850  
PHI .35.000  
MACH 5.220

PARAMETRIC VALUES  
ALPHA RN/L  
-9C.000 BETA .000  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

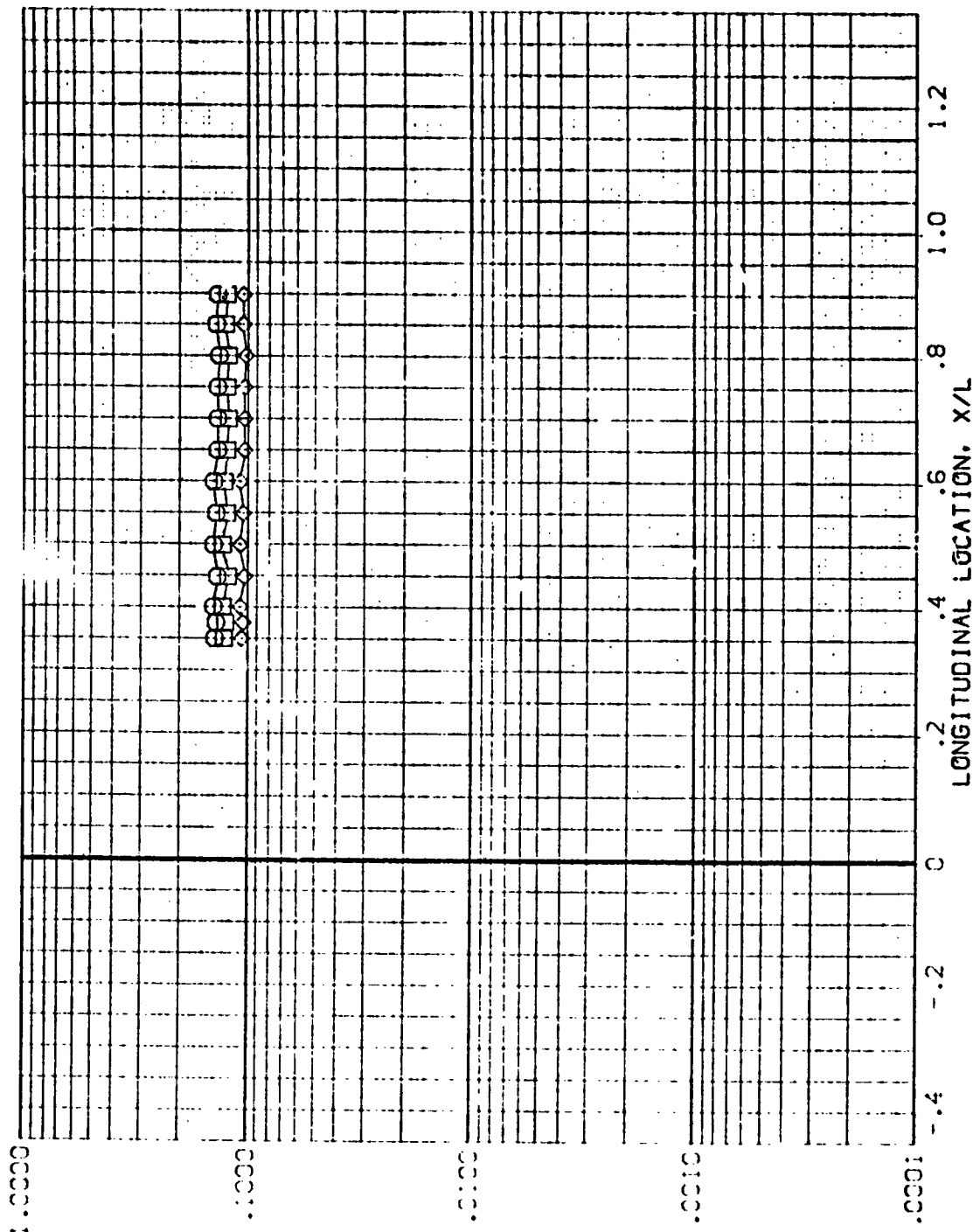


FIG. 4 TANK, ALONE

AVES 3.5-195 IH28 T1      EXTERNAL TANK      (REV T16)  
 PARAMETRIC VALUES  
 -90.000    BETA    .000  
 ALPHA  
 RN/L    1.000

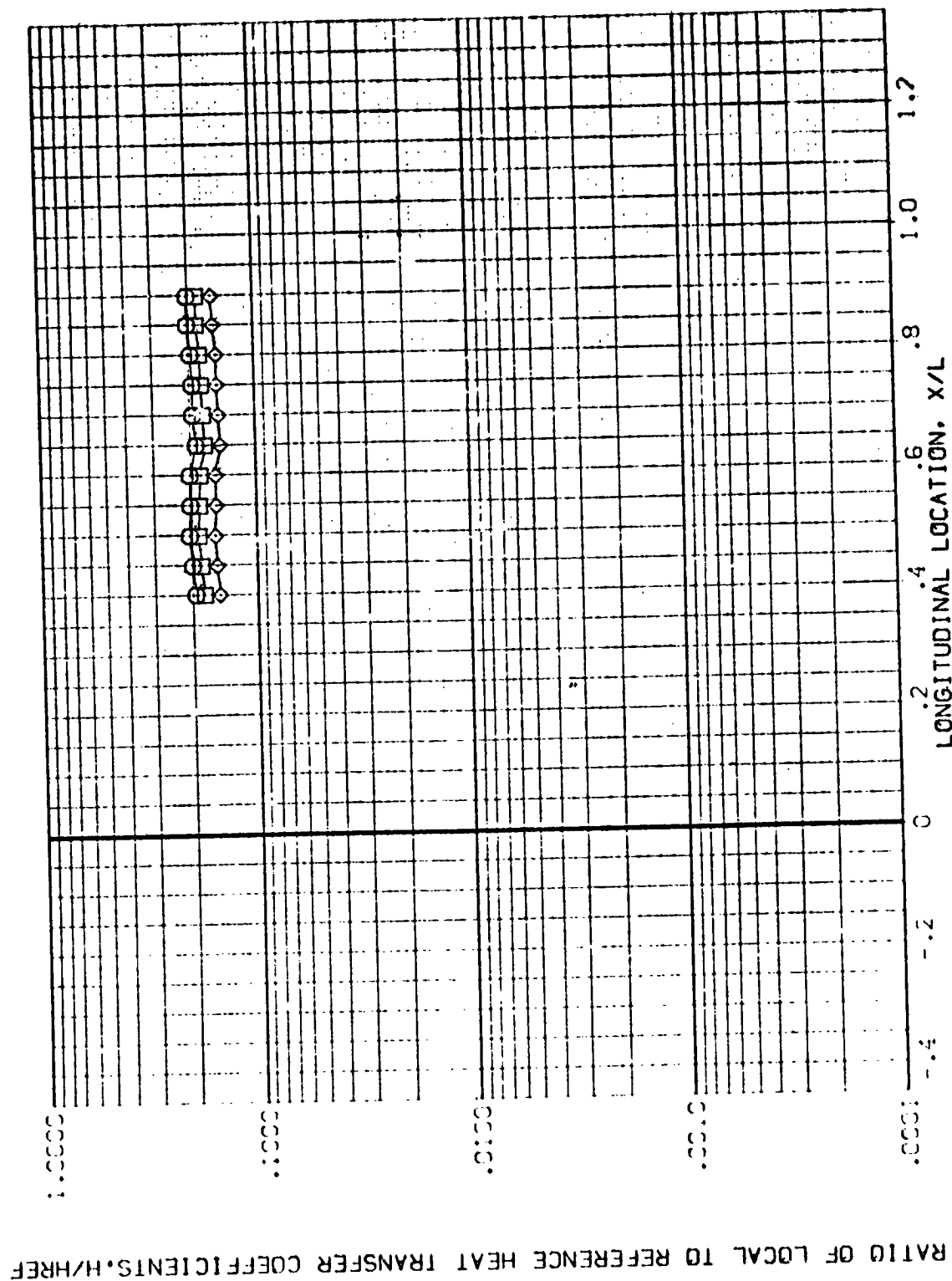


FIG. 4 TANK, ALONE



(REV16)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYNCH

WAVELENGTH  
1.850  
1.800  
1.000

RE-1  
180.000  
5.220

PARAMETRIC VALUES  
ALPHA  
-90.000  
R/L  
1.000  
ETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $\eta/\eta_{REF}$

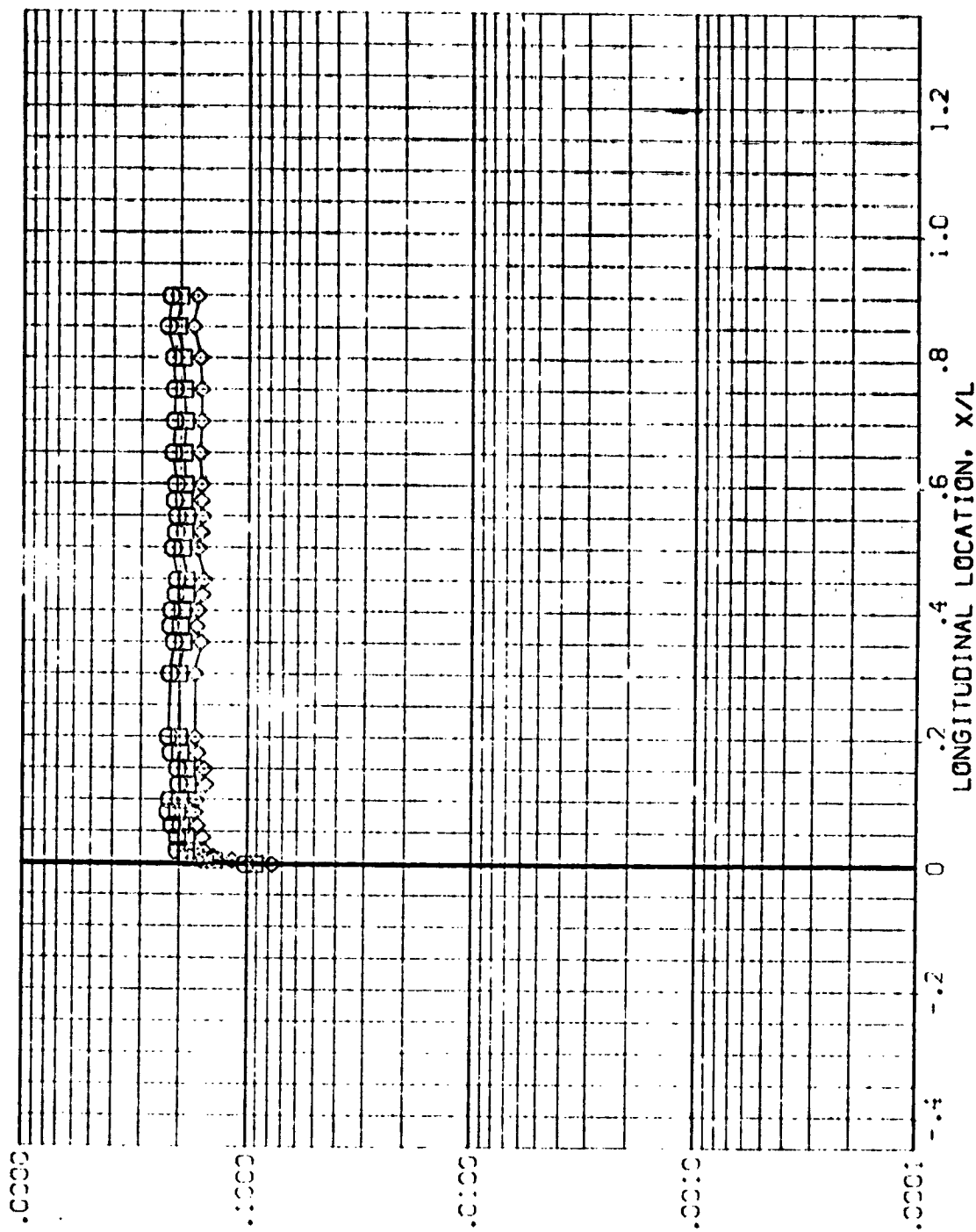


FIG. 4 TANK, ALONE

AVES 3.5-195 IH28 T1 EXTERNAL TANK

(RE.T17)

SYMBOL

HA/W/HT

Re

MACH

5.220

.850

.900

1.000

PARAMETRIC VALUES

ALPHA

-120.000

BETA

.000

Re/L

1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

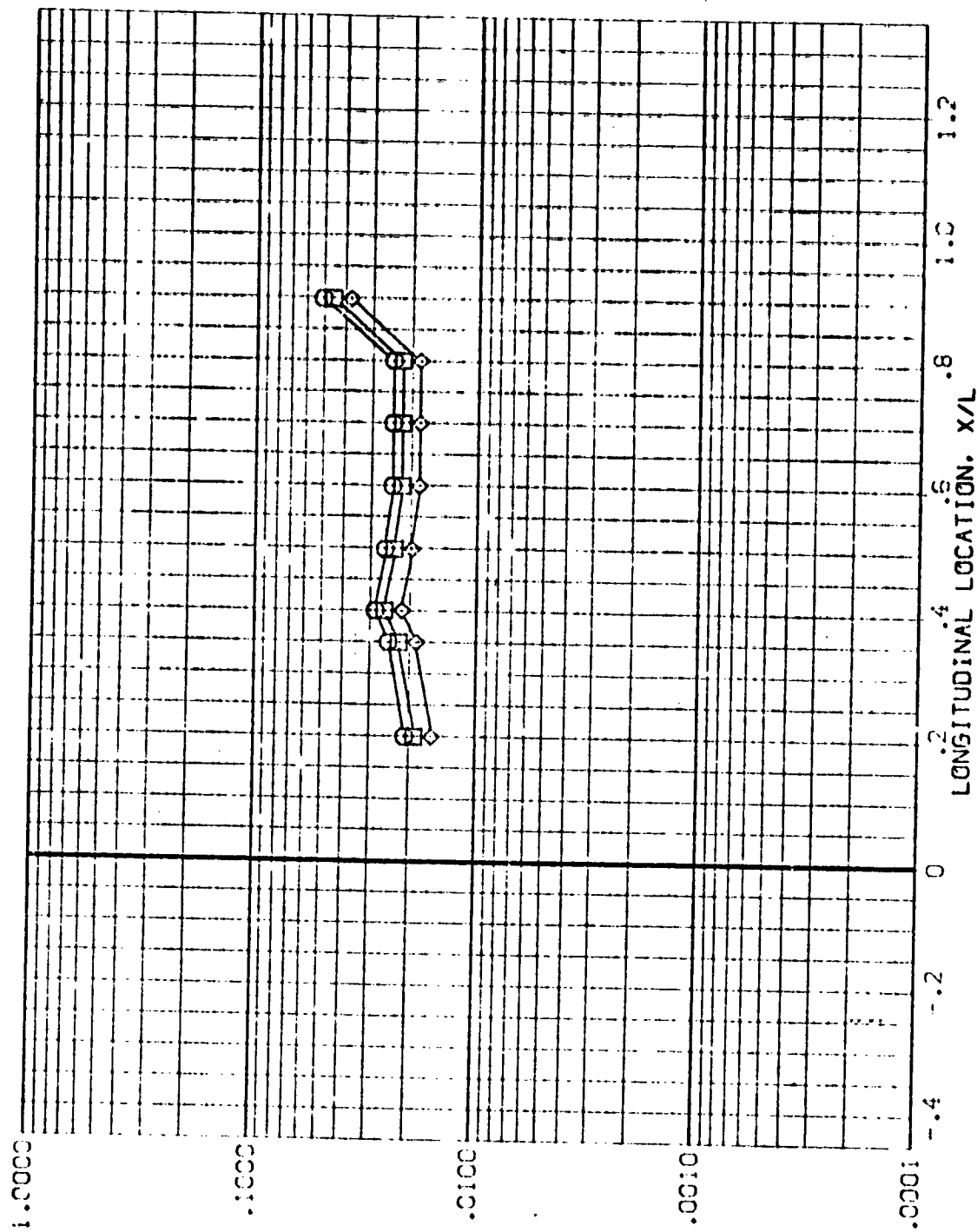


FIG. 4 TANK, ALONE

(REVISED)

EXTERNAL TANK

AVES 3.5-195 1H28 T1

PARAMETRIC VALUES  
 ALPHA 1.000000  
 BETA 1.000000  
 C/L 1.000000

MACT 112.500 5.220

MACT 112.500 5.220  
 .850  
 .850  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

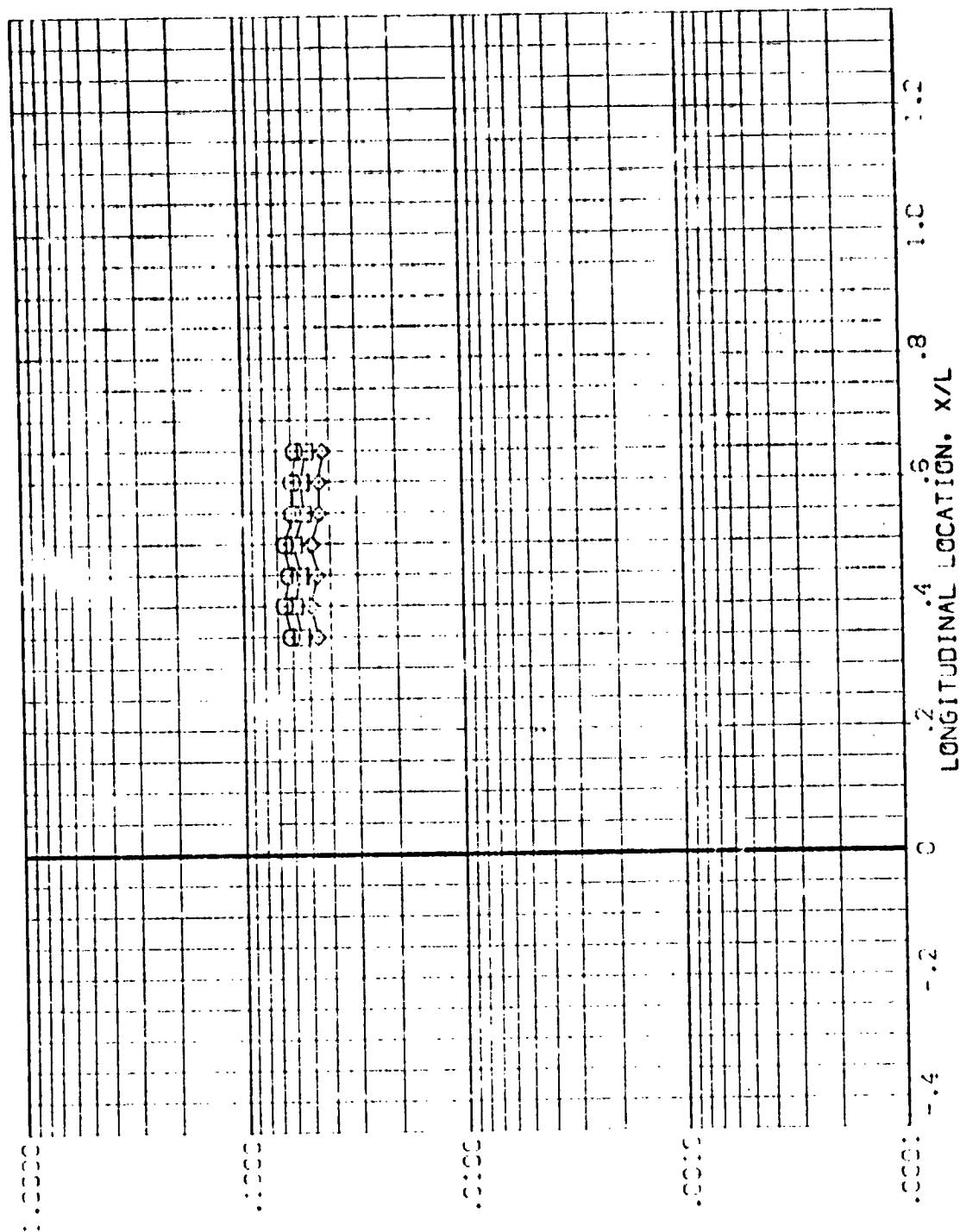


FIG. 4 TANK ALONE

(REV17)

EXTERNAL TANK

AVES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RN/L 1.000

SWEEP- HAW/H-1 P-1 VICH  
.850 195.000 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

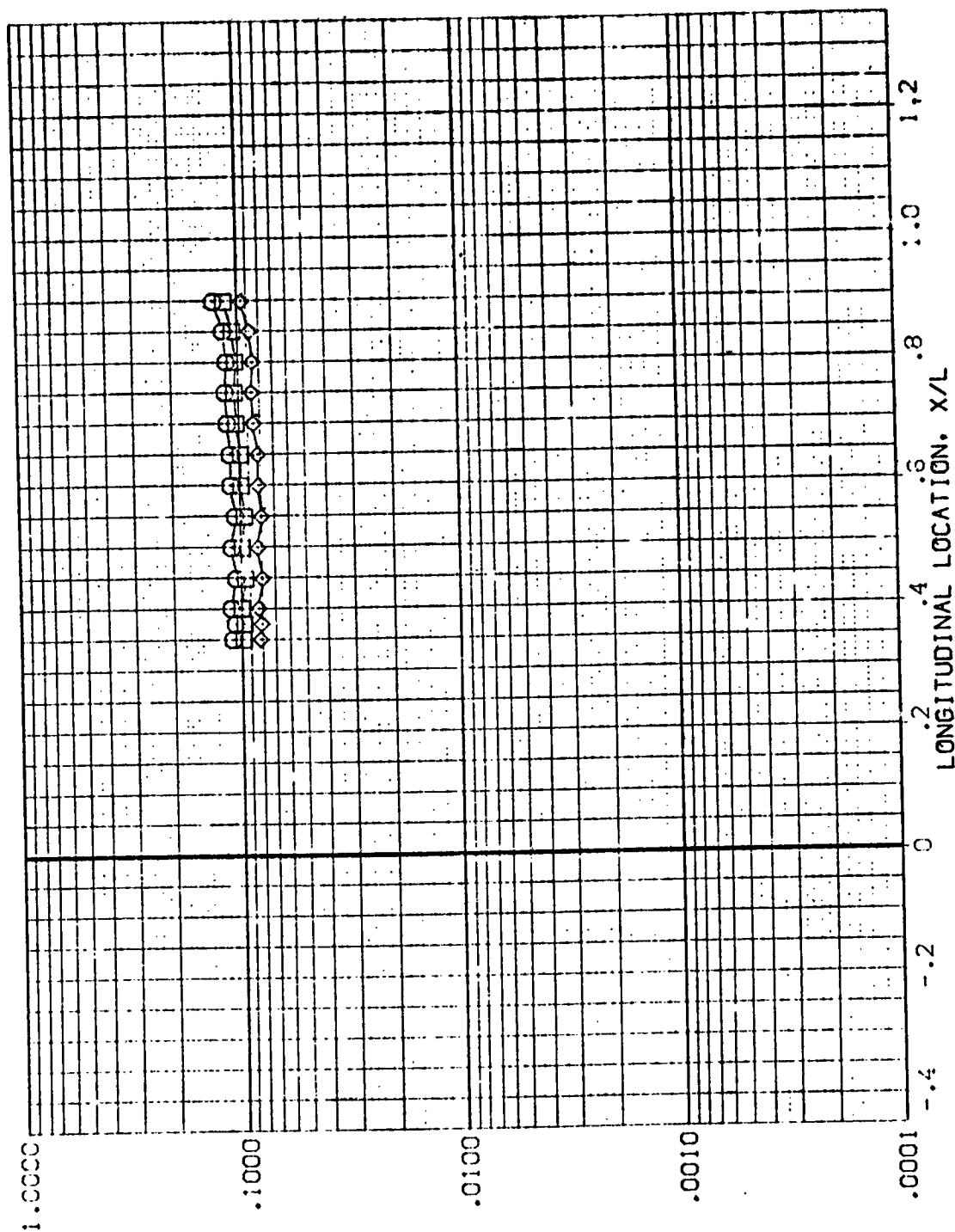


FIG. 4 TANK, ALONE

(REV117)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RH/L 1.000

SYMBOL  
◇ □  
HAM/HT .850  
PHI 157.500  
MACH 5.220  
1.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

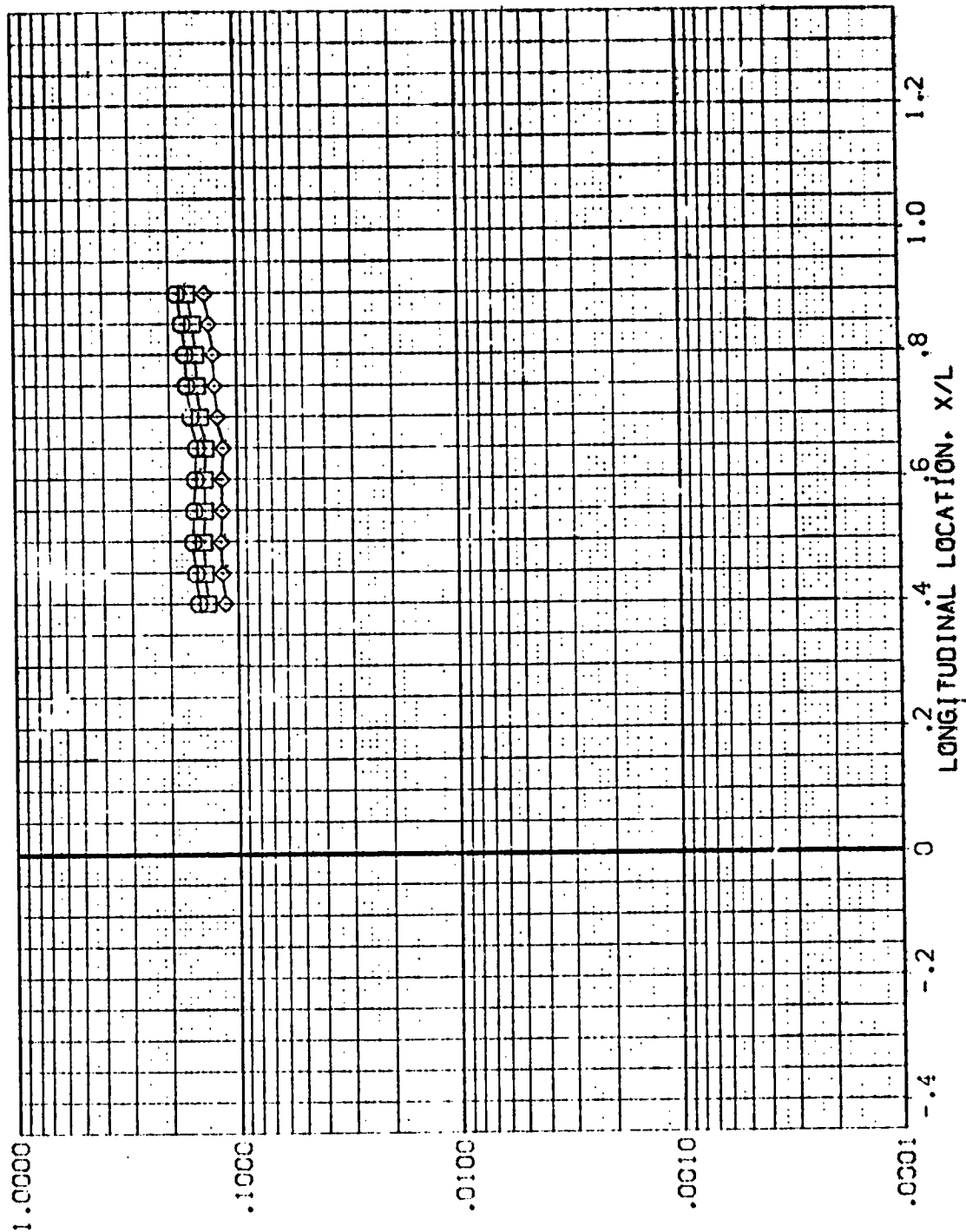


FIG. 4 TANK ALONE

AMES 3.5-:95 IH28 TI

SYNSET	44W/HT	PHI	NACH
0110	.850	190.000	5.220
	.000		
	1.000		

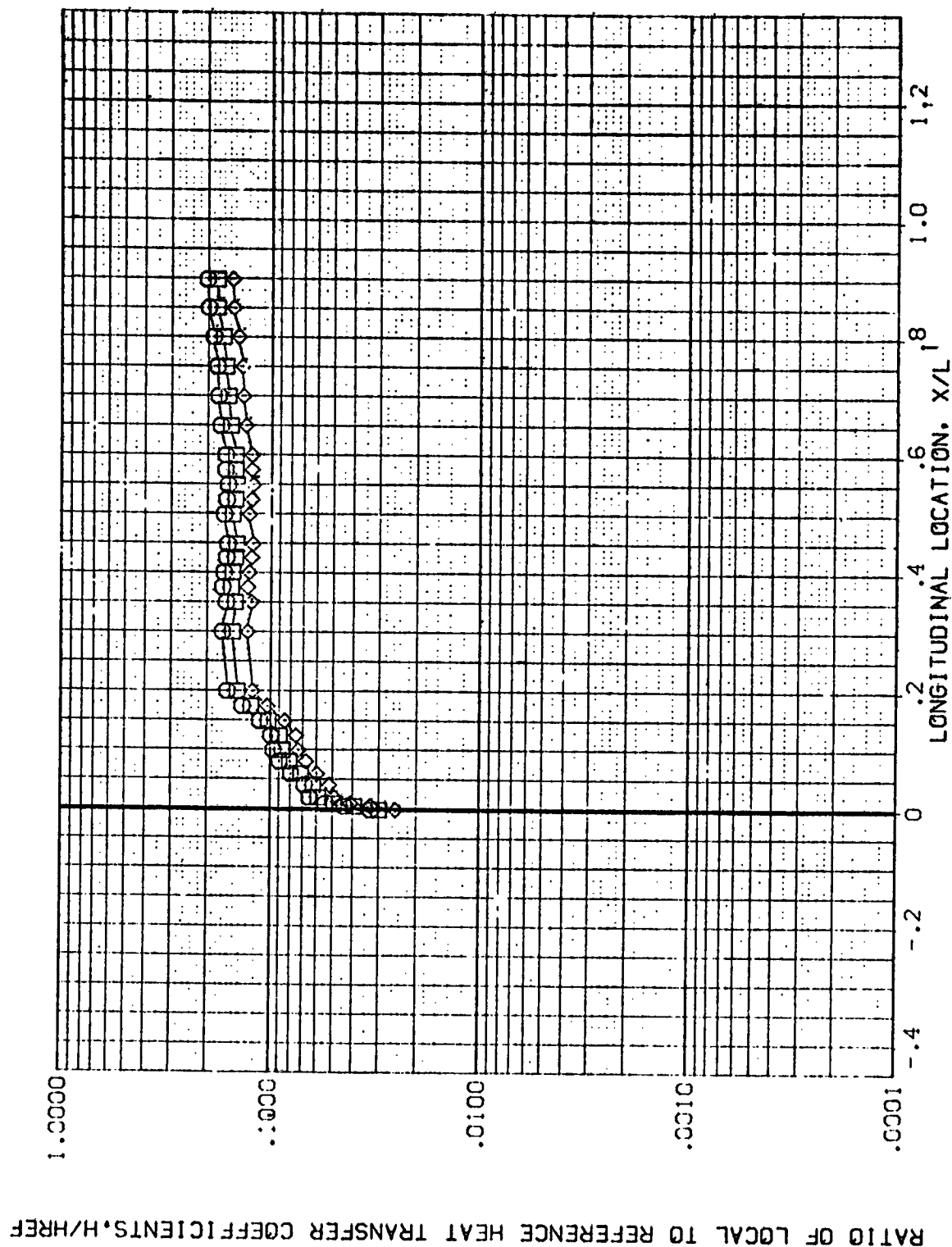


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV118)

SYMBOL HAW/HT PH: MACH  
 □ .850 90.000 5.303  
 ◇ .900 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 SETA .000  
 RN/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

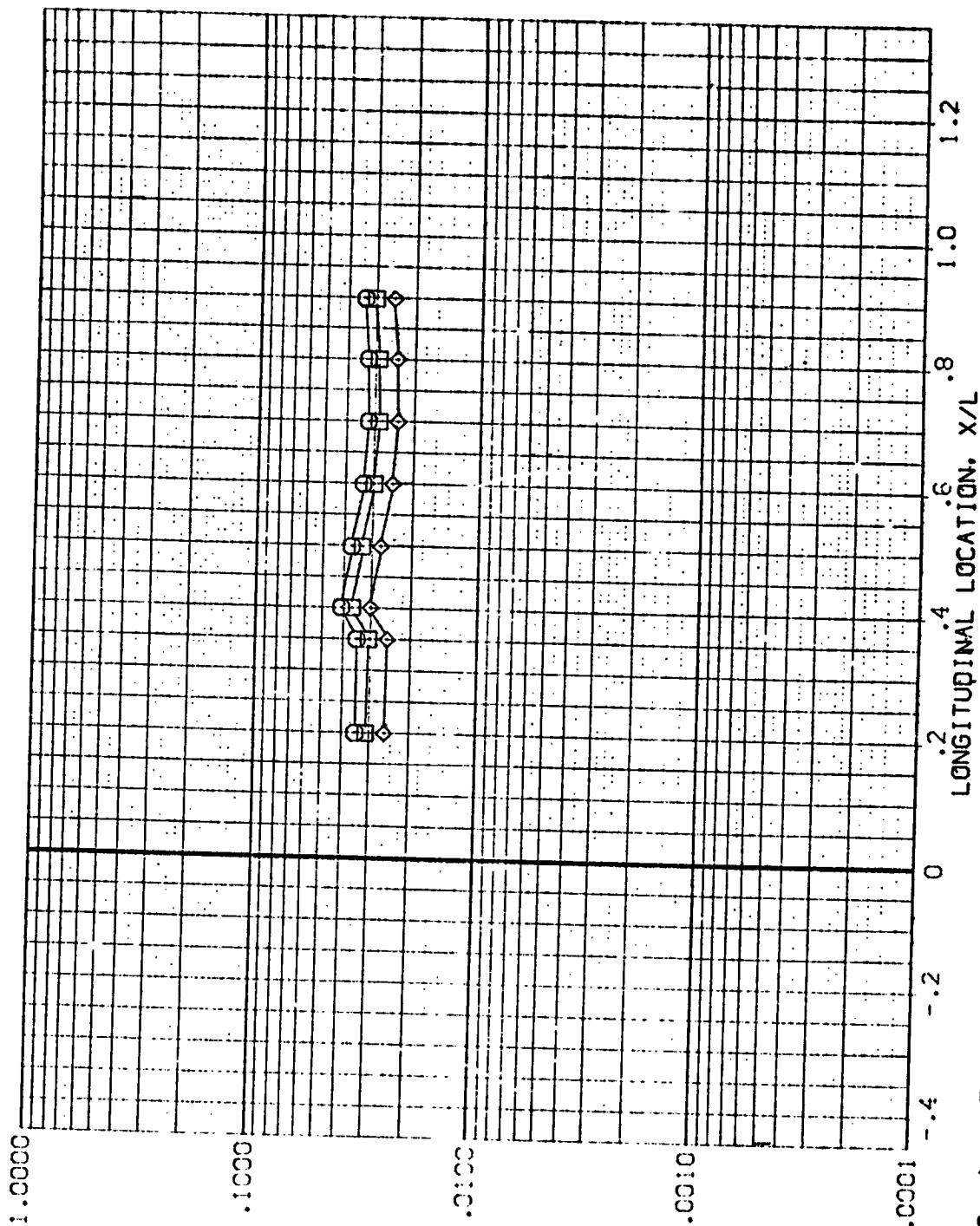


FIG. 4 TANK, ALONE

ANES 3.5-:95 IH28 T1 EXTERNAL TANK (REV18)

SYMBOL	WAV/WT	PHI	MACH	PARAMETRIC VALUES
◇	.850	:12.500	5.303	ALPHA
◇	.900			-90.000
◇	:.500			BETA
				4.000
				.000

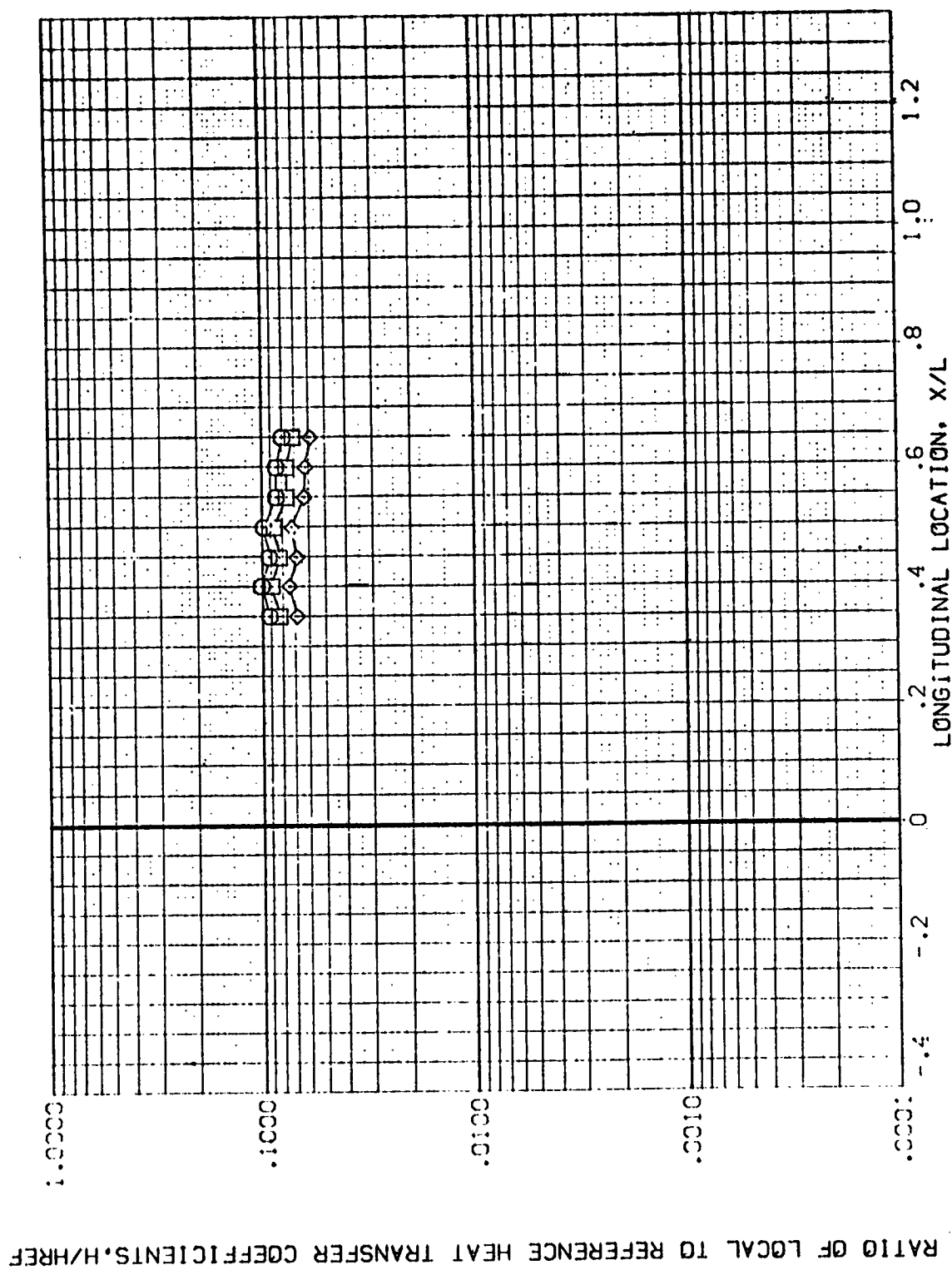


FIG. 4 TANK, ALONE



# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV118)

SYMBOL

WAV/HT  
.850  
.900  
1.000

PL: MACH  
135.000 5.303

PARAMETRIC VALUES  
ALPHA -90.000 BETA .000  
RN/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

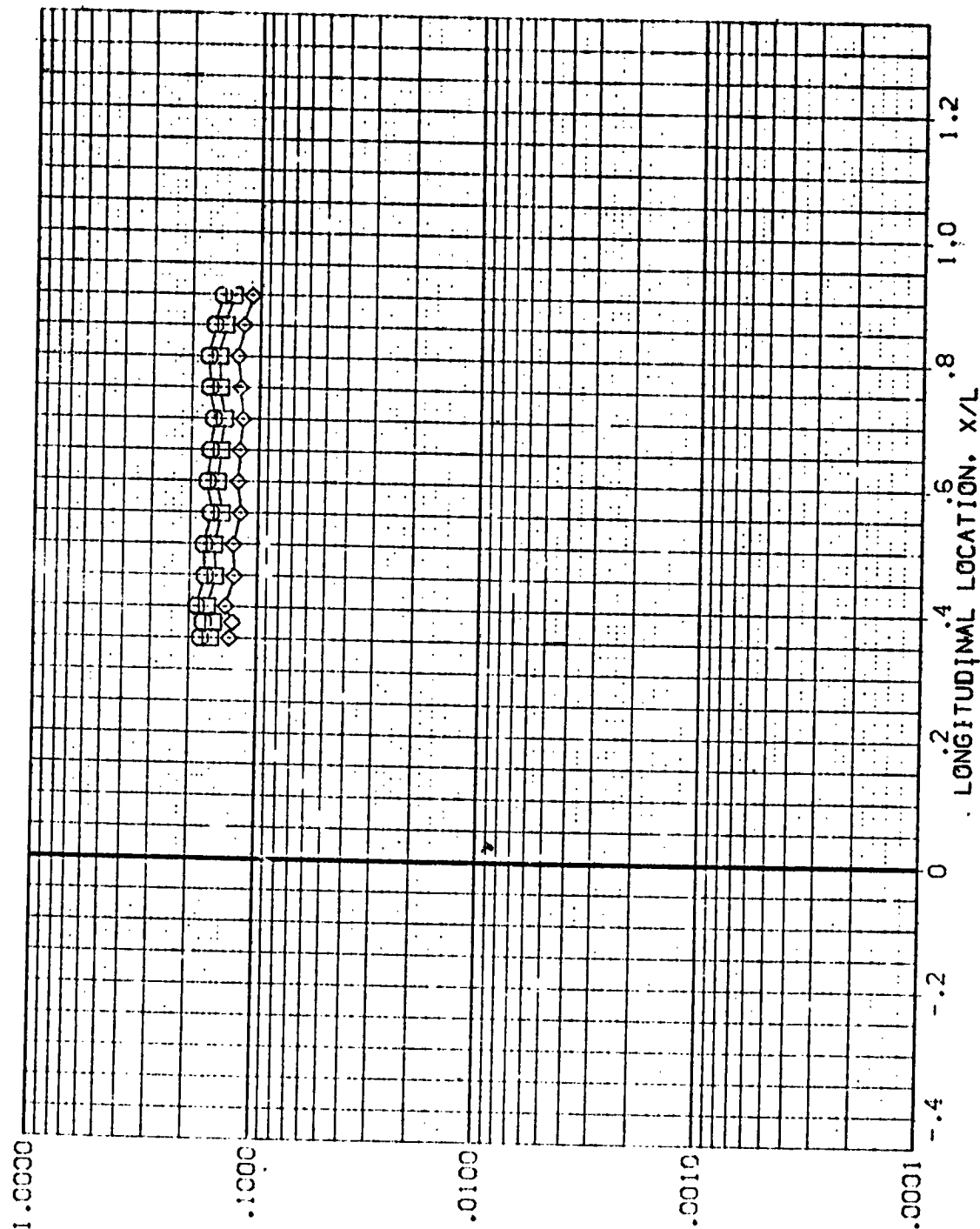


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV T18)

SYMBOL	HAZ/RT	P41	MACH	PARAMETRIC VALUES
□	.850	157.500	5.303	-90.0°
◇	.900			BETA
	1.000			4.000
				.000

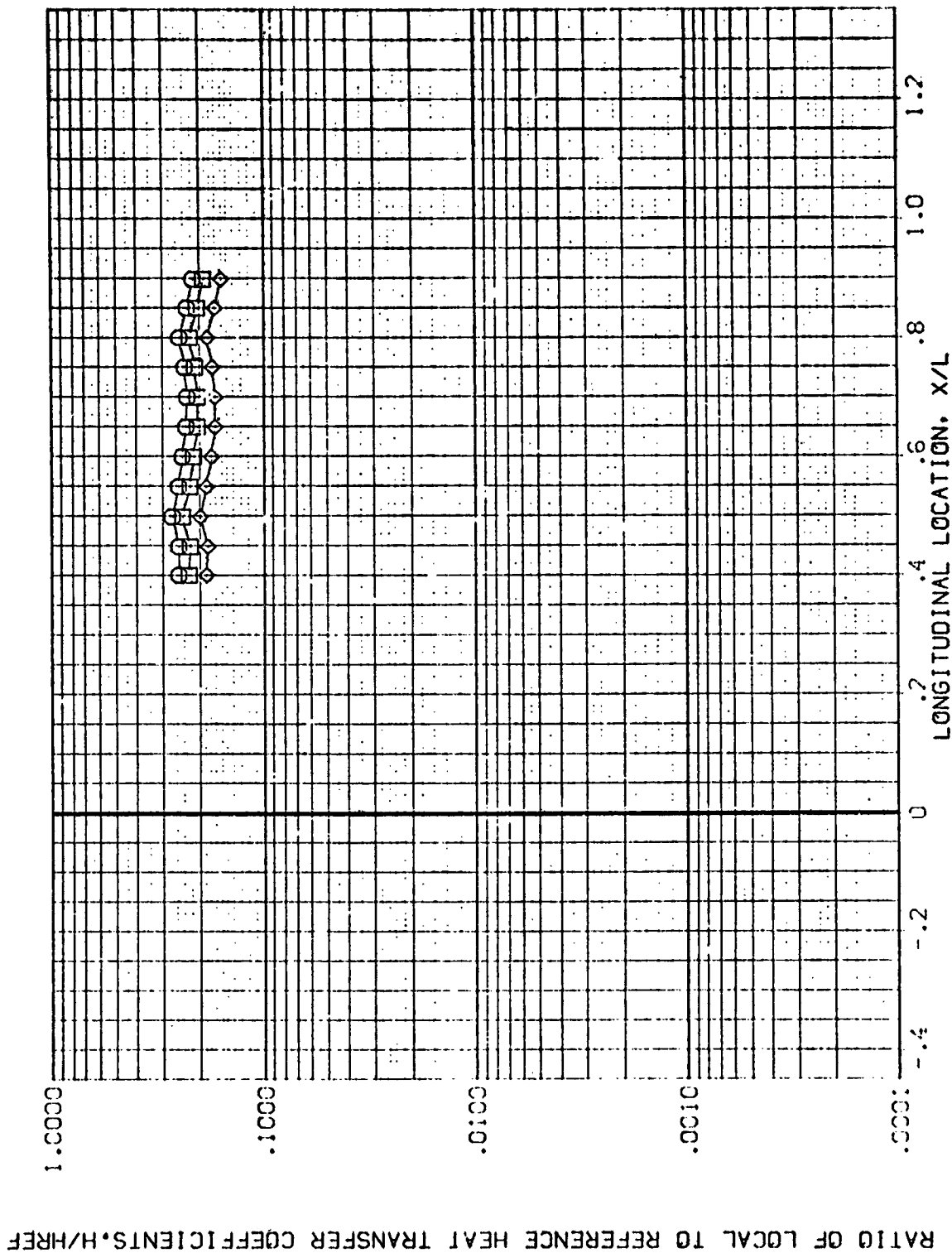


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1

EXTERNAL TANK

(REV18)

PARAMETRIC VALUES  
 ALPHA -90.000  
 BETA 4.000  
 PHI/L .000

SYNOPSIS  
 PHASE .852  
 PHI 180.000  
 MACH 5.303  
 .900  
 1.000

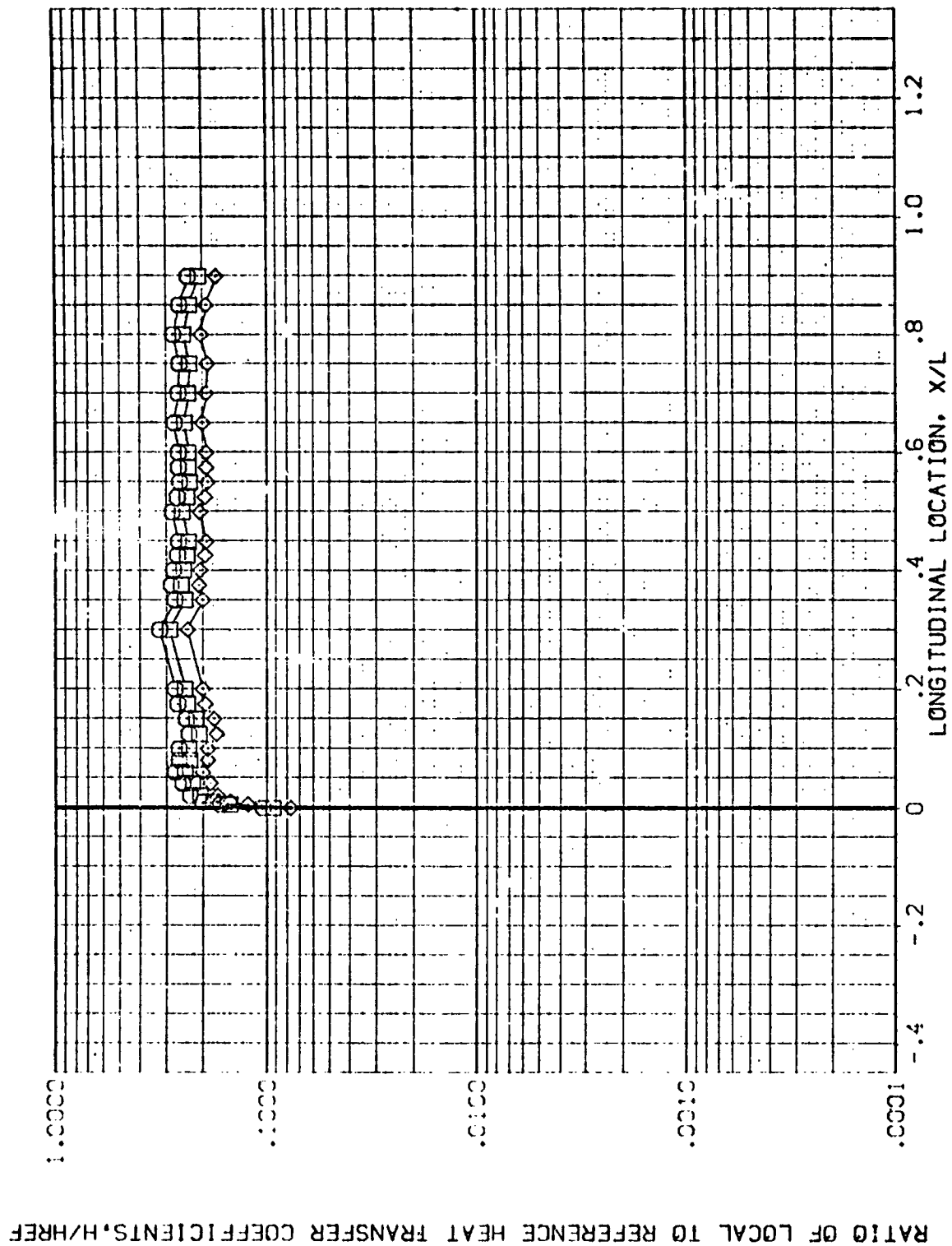


FIG. 4 TANK, ALONE

# AVES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

PARAMETRIC VALUES  
 ALPHA .000 BETA .000  
 R1/L 1.000

WAVELENGTH V/L VACK  
 .850 .350 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

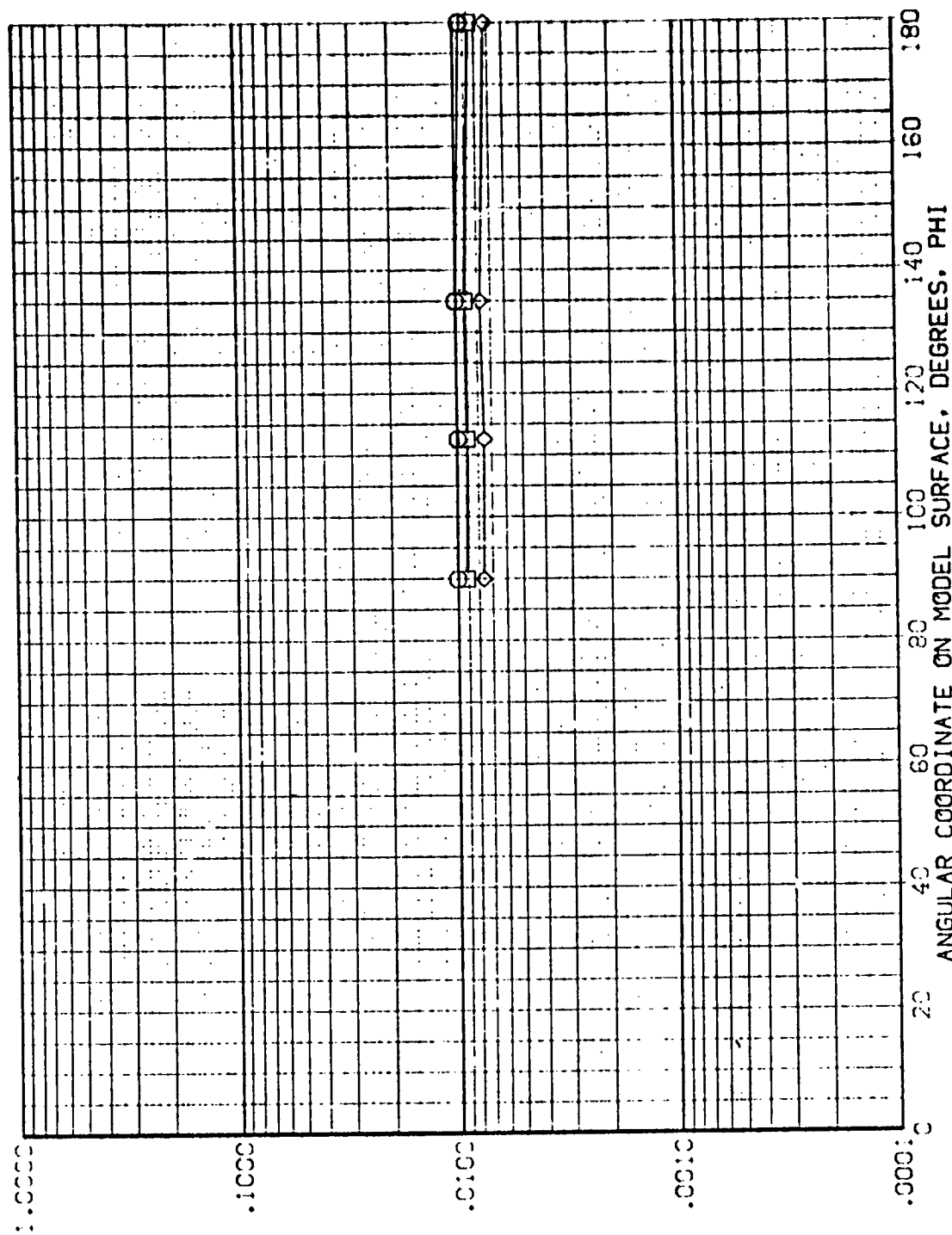


FIG. 4 TANK, ALONE

# AVES 3.5-195 IH28 T1 EXTERNAL TANK (REV13)

SYMBOL:  $\diamond$   $\square$   $\square$

W\* $\rho$ /H\* X/L MACH  
 .850 .400 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000 BETA .000  
 PM/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

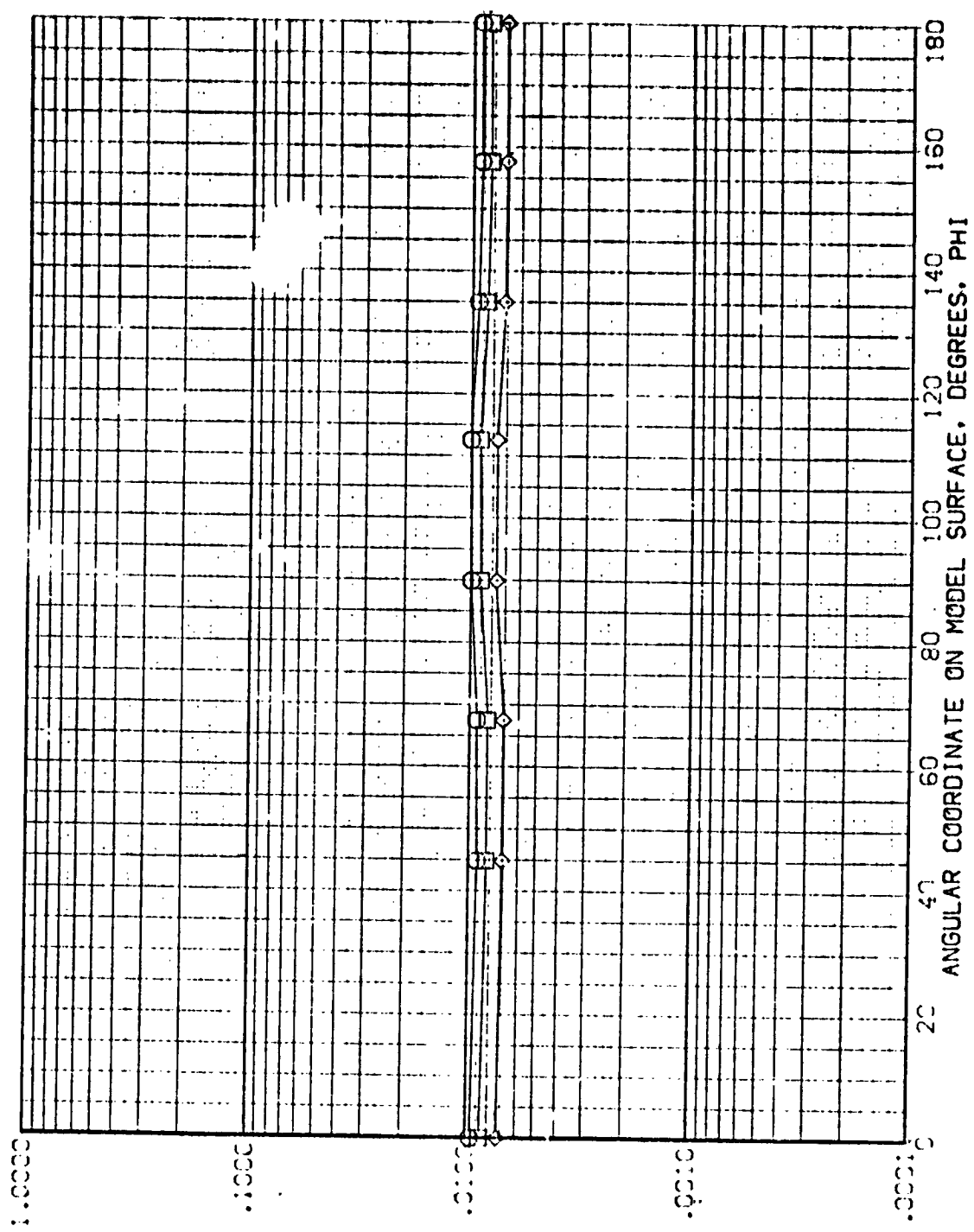


FIG. 4 TANK, ALONE

# AVES 3.5-195 IH28 T1 EXTERNAL TANK

(REV T13)

PARAMETRIC VALUES  
 .000 BETA  
 .000  
 1.000

ALPHA  
 RN/L

MACH  
 5.220

Y/L  
 .450

WAVELENGTH  
 .850

.900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

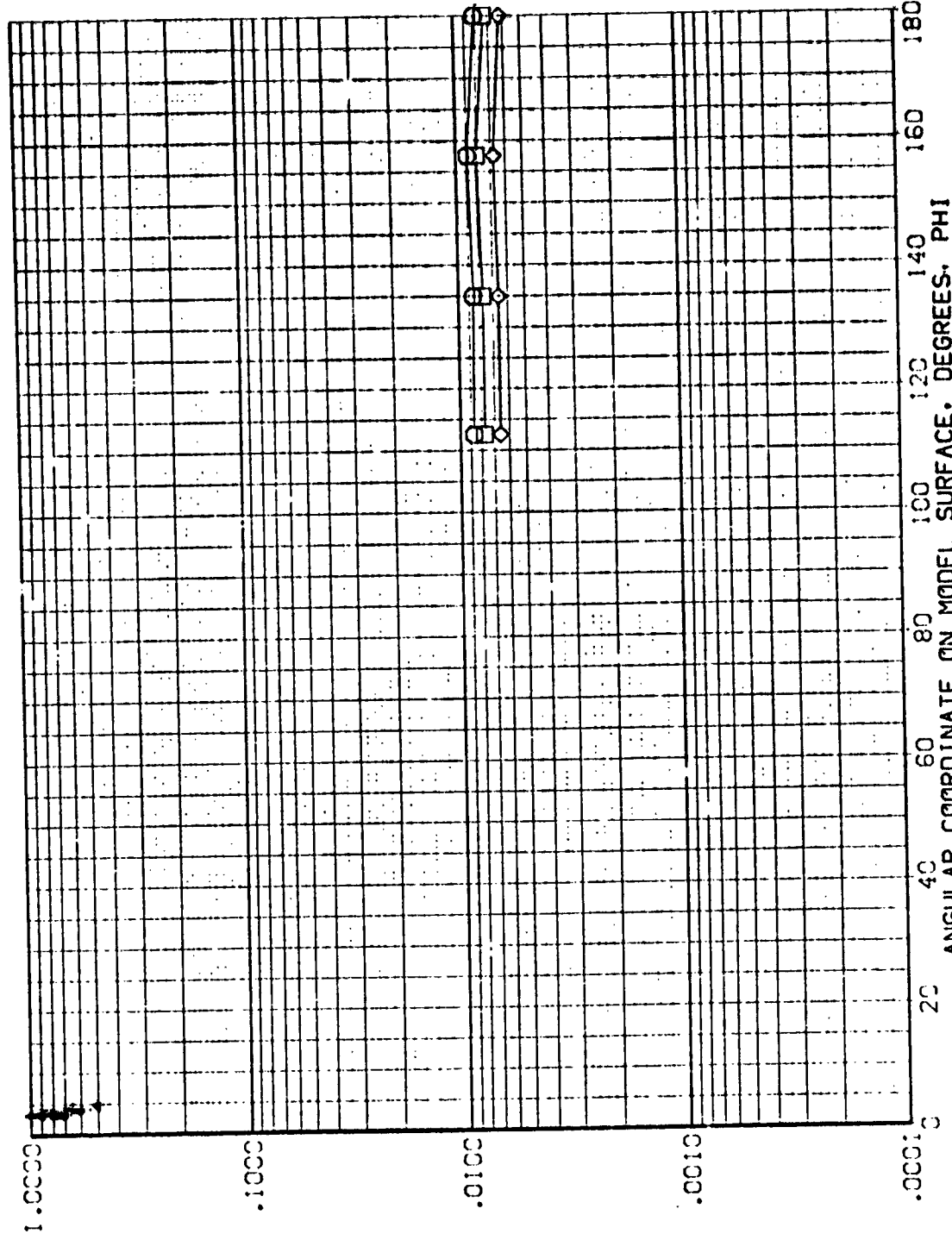


FIG. 4 TANK, ALONE

(REV113)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA .000  
BETA .000  
PHI/L 1.000

ALPHA  
PHI/L

HEIGHT X/L MACH  
.850 .500 5.120  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

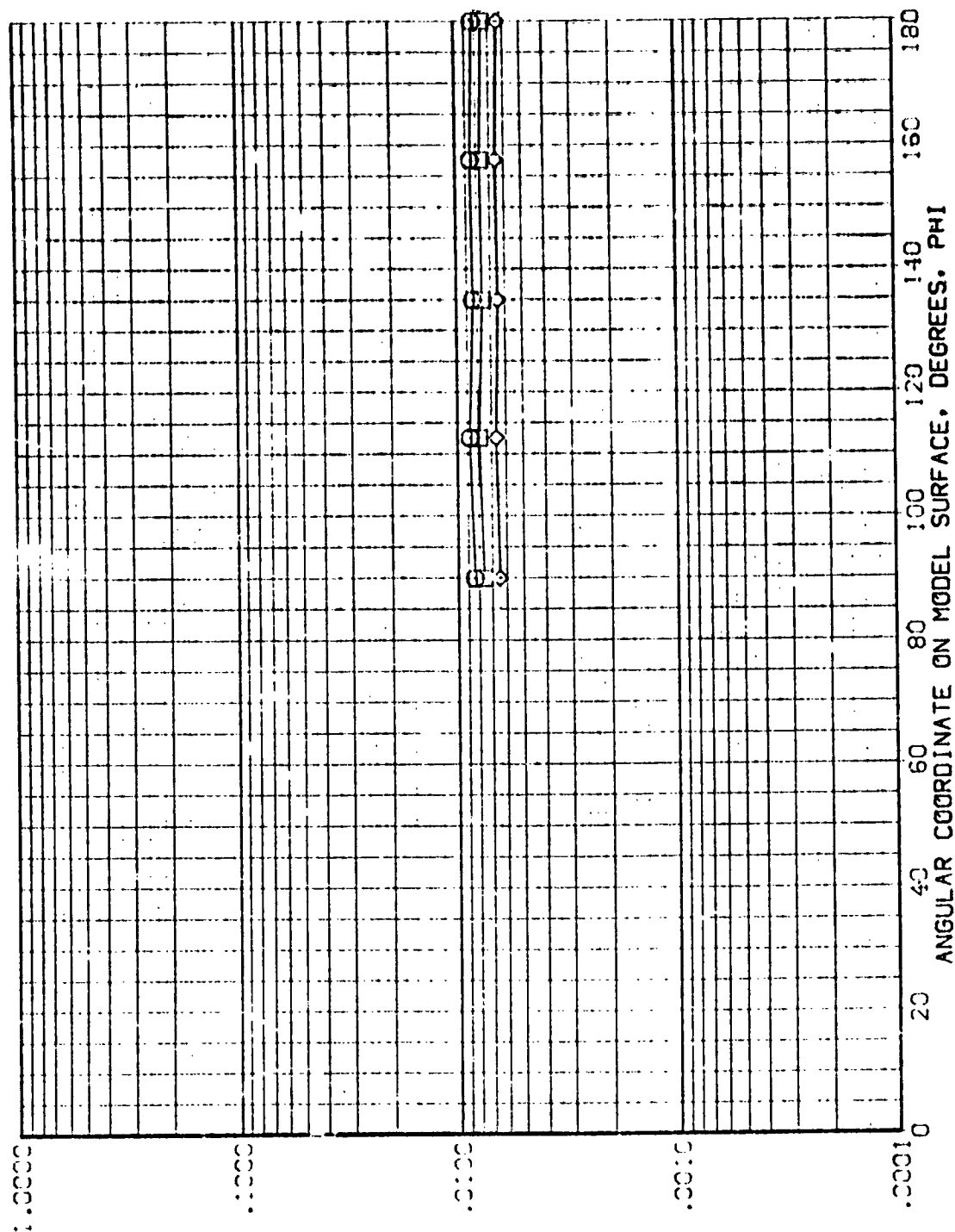


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 TI EXTERNAL TANK

(REV113)

PARAMETRIC VALUES		
ALPHA	BETA	
0.000	0.000	
0.500	0.500	
1.000	1.000	

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

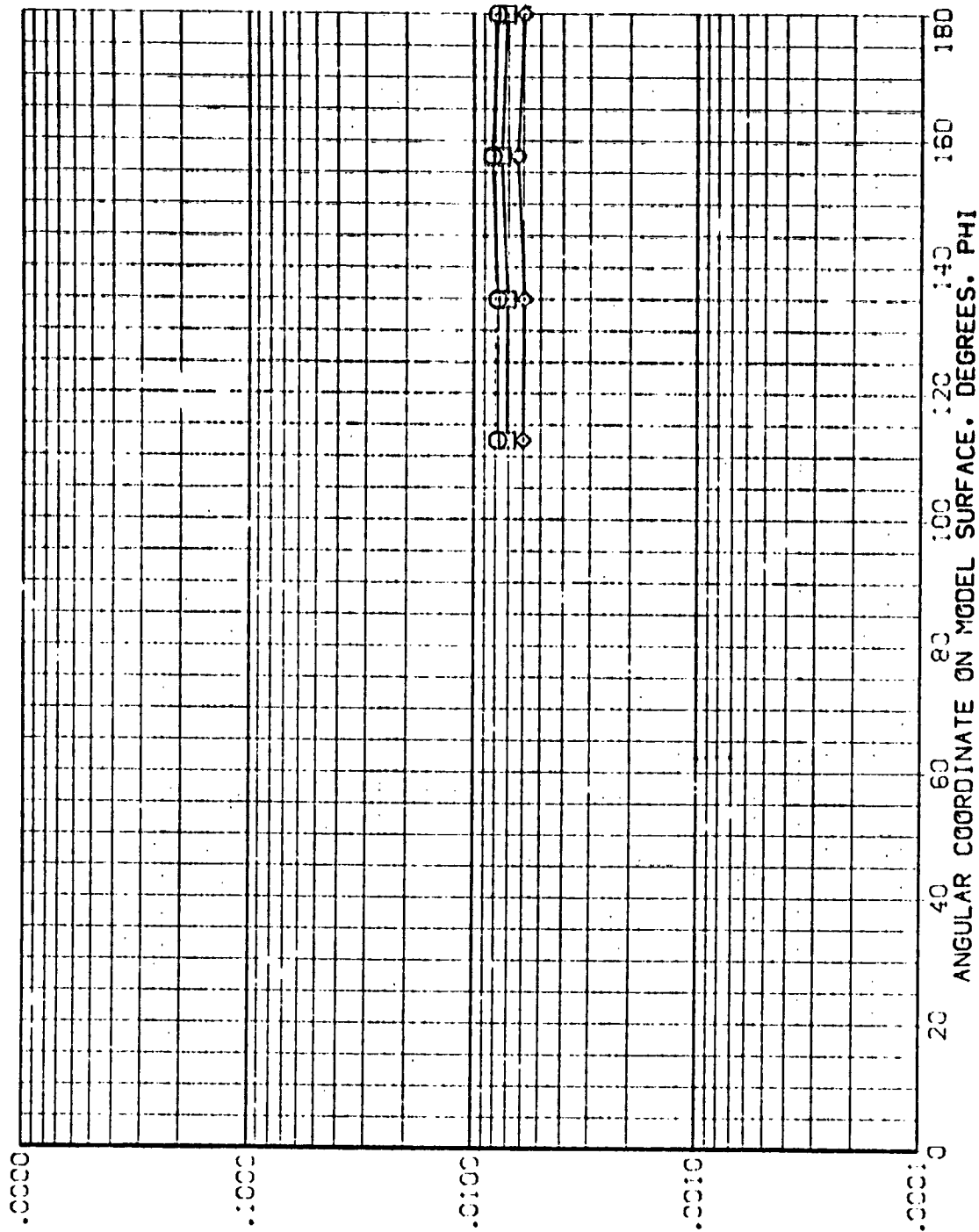


FIG. 4 TANK, ALONE



# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV 100)

SVES-  
-H/HREF  
.850  
.900  
1.000

X/L .600 MACH 5.220

PARAMETRIC VALUES  
ALPHA .000 REYN  
RV/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

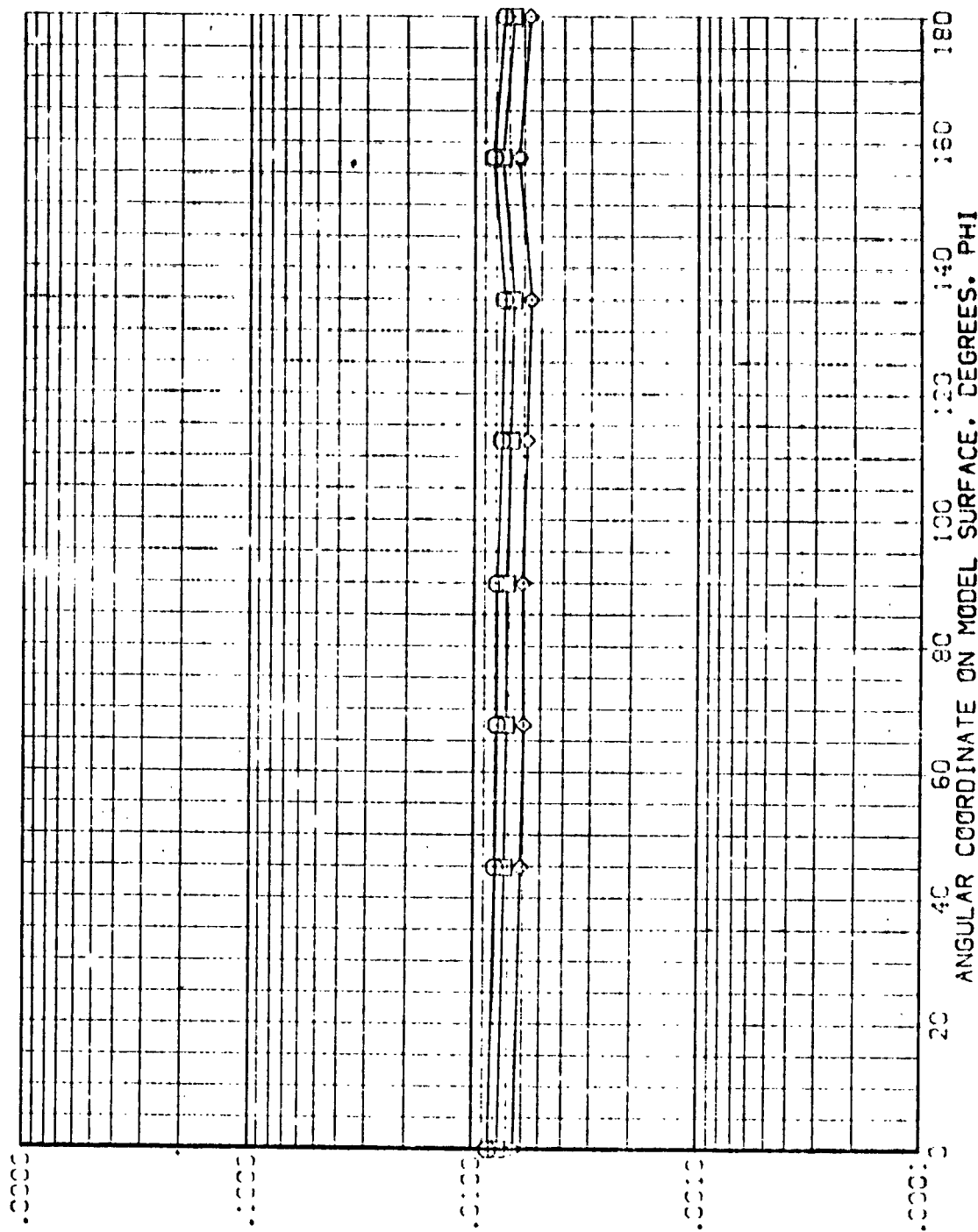


FIG. 4 TANK ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

SYMBOL H/H/REF X/L MACH  
 □ □ □ .850 .650 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000 BETA .000  
 PH/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H/REF

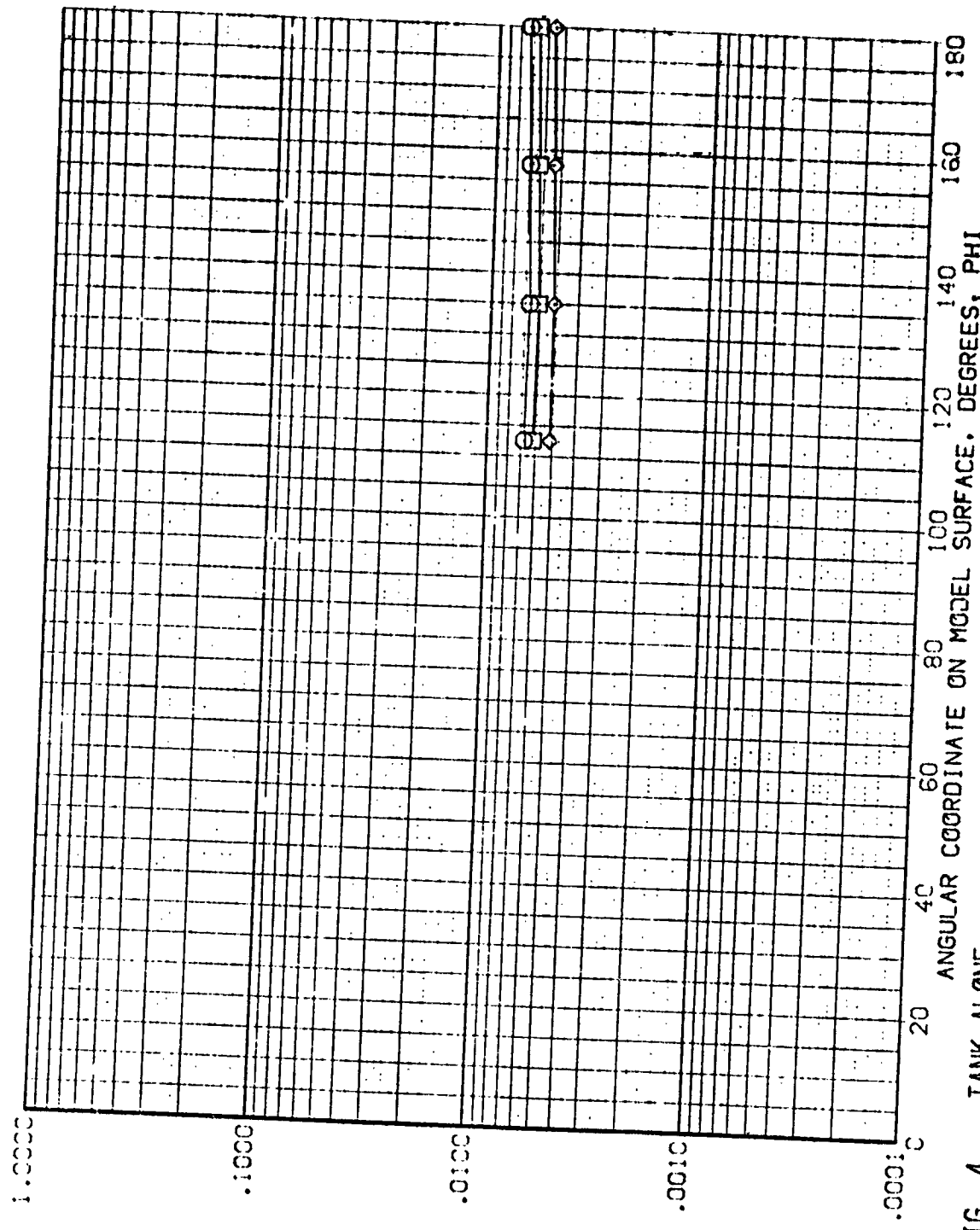


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1

EXTERNAL TANK

(REV113)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES		
◇	.850	.700	5.220	ALPHA	BETA	.000
□	.900			PHI/L		1.000
○	1.000					.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

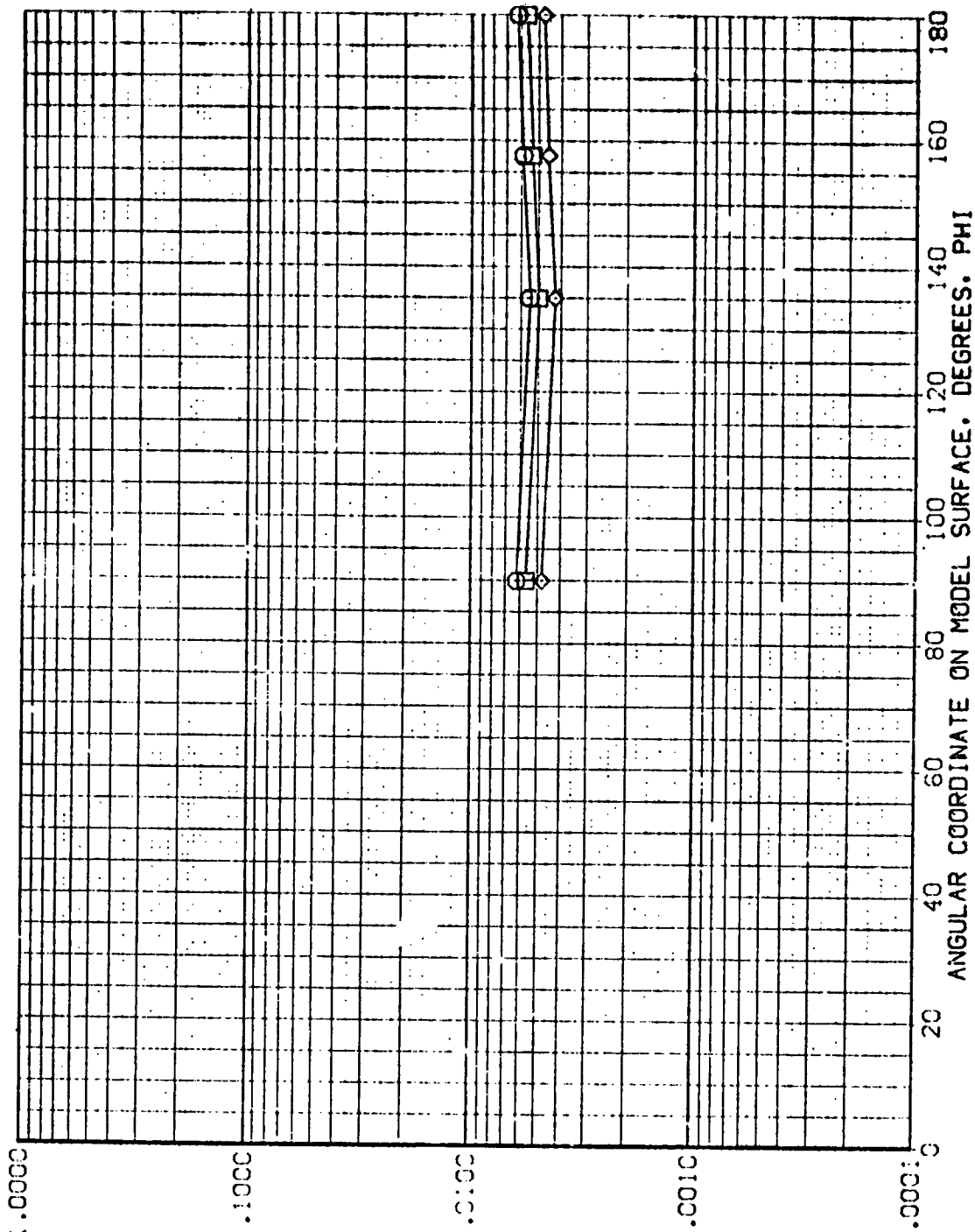


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

SYMBOL  
 HAW/HT  
 .850  
 .900  
 1.000

X/L  
 .750  
 MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 PIV/L  
 .000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

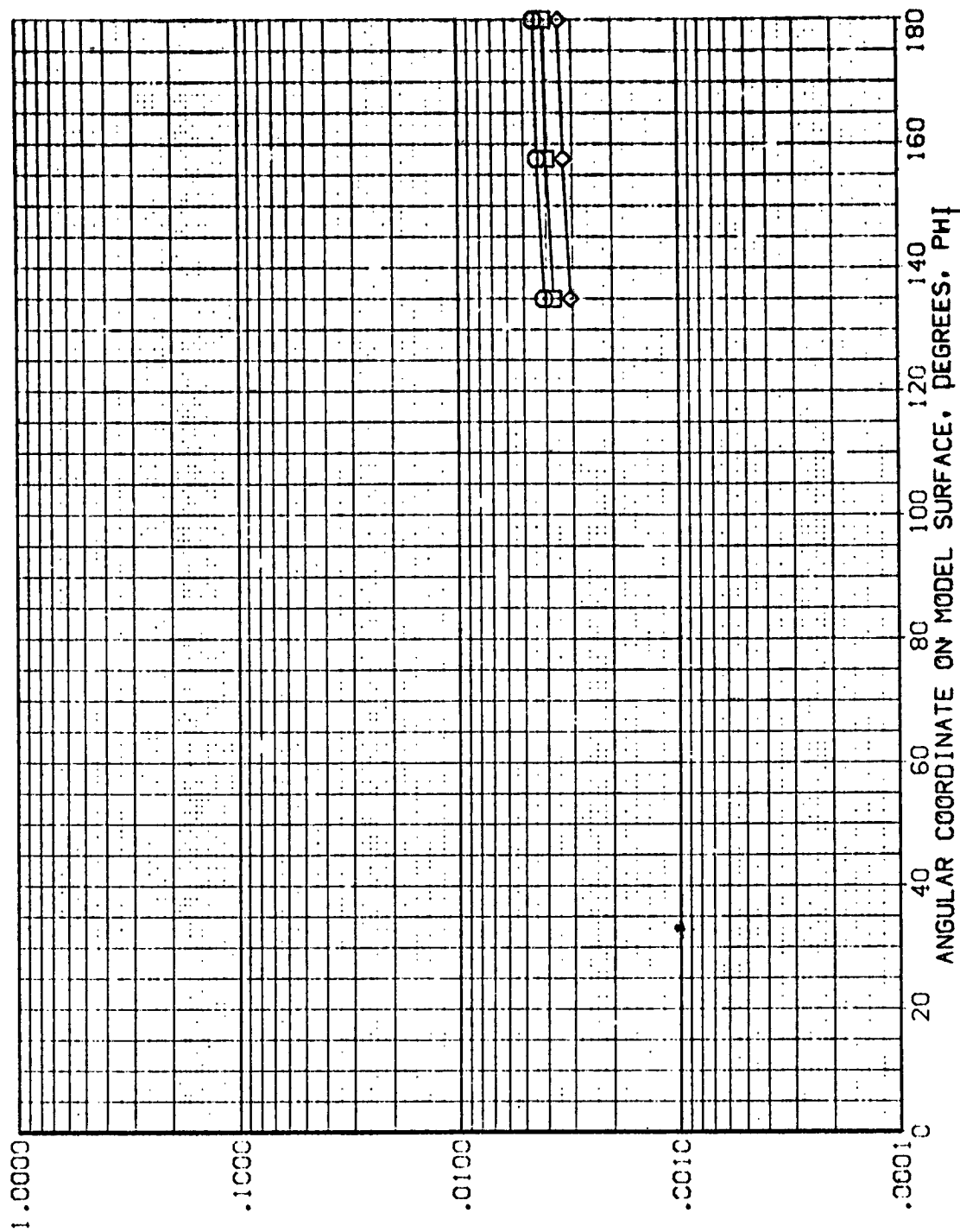


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

SYMBOL H/W/H T X/L MACH  
 .850 .800 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

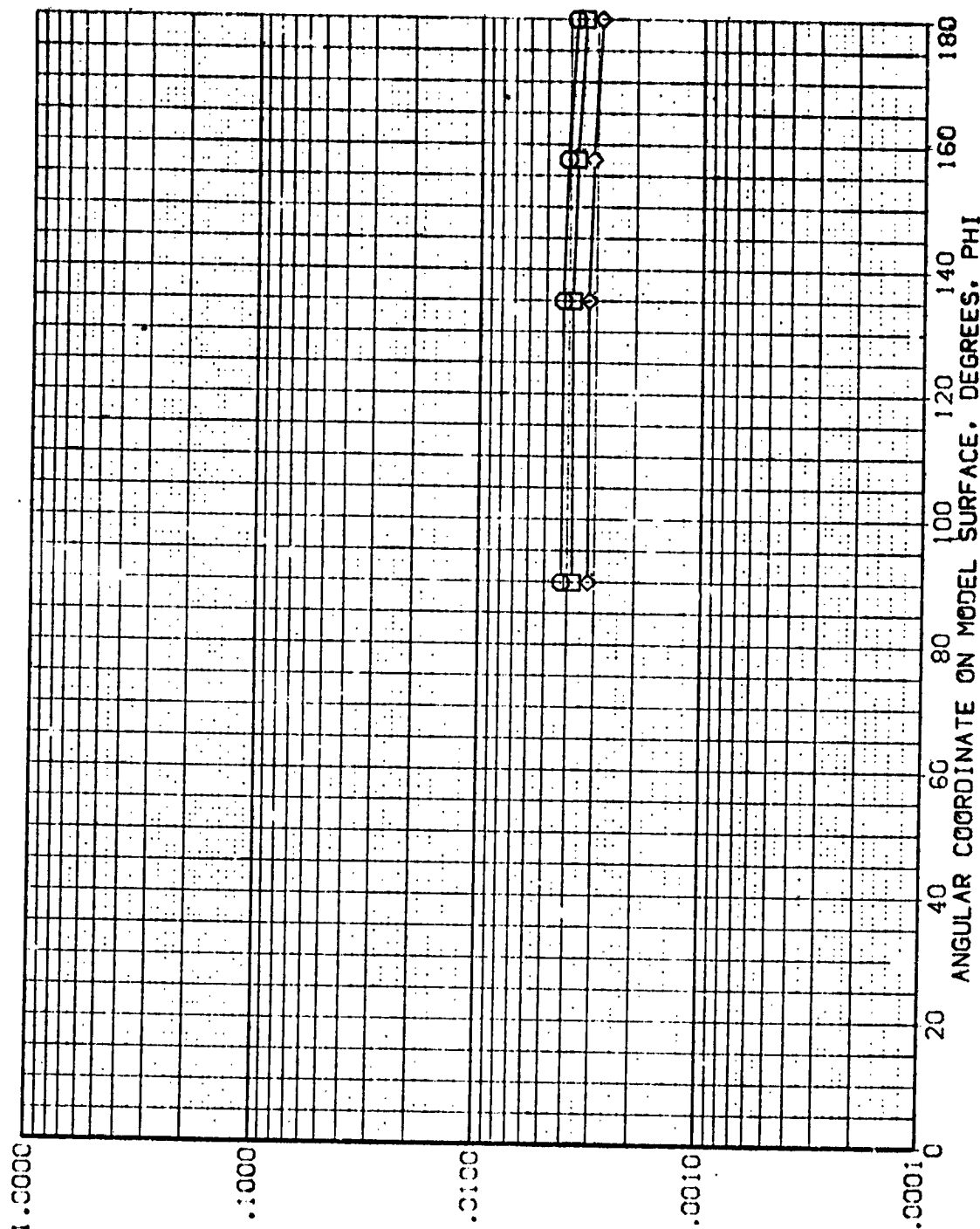


FIG. 4 TANK, ALONE

AMES 3.5-195 1H28 T1 EXTERNAL TANK

(REV113)

SYMBOL

HAW/HT  
.850  
.900  
1.000

X/L  
.850

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RN/L

.000  
1.000

BETA

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

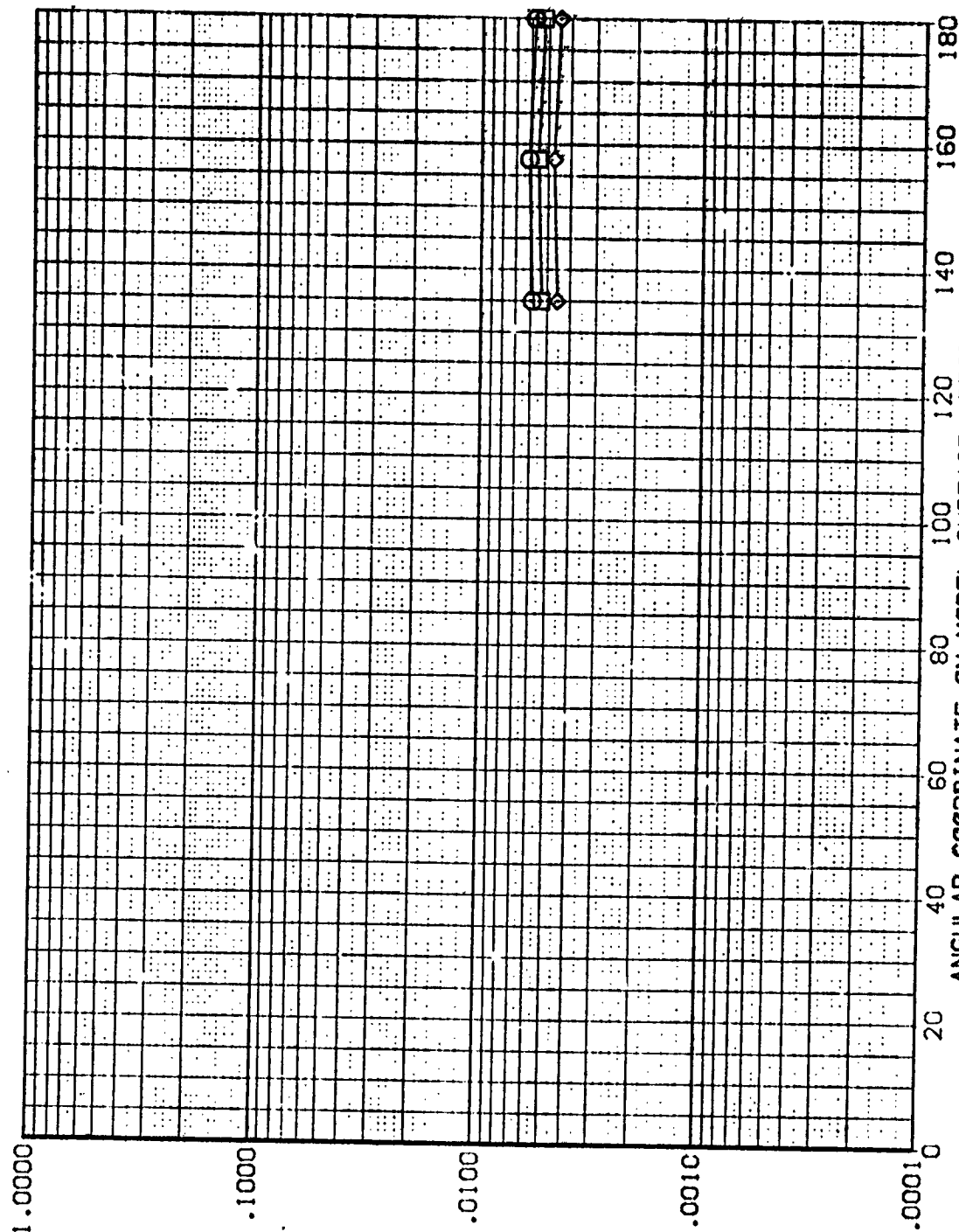


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV113)

SYMBOL  
 ◇  
 □  
 ○

HAW/HT .850  
 .900  
 1.000  
 X/L .900  
 MACH 5.220

PARAMETRIC VALUES  
 ALPHA  
 RNL  
 .070  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

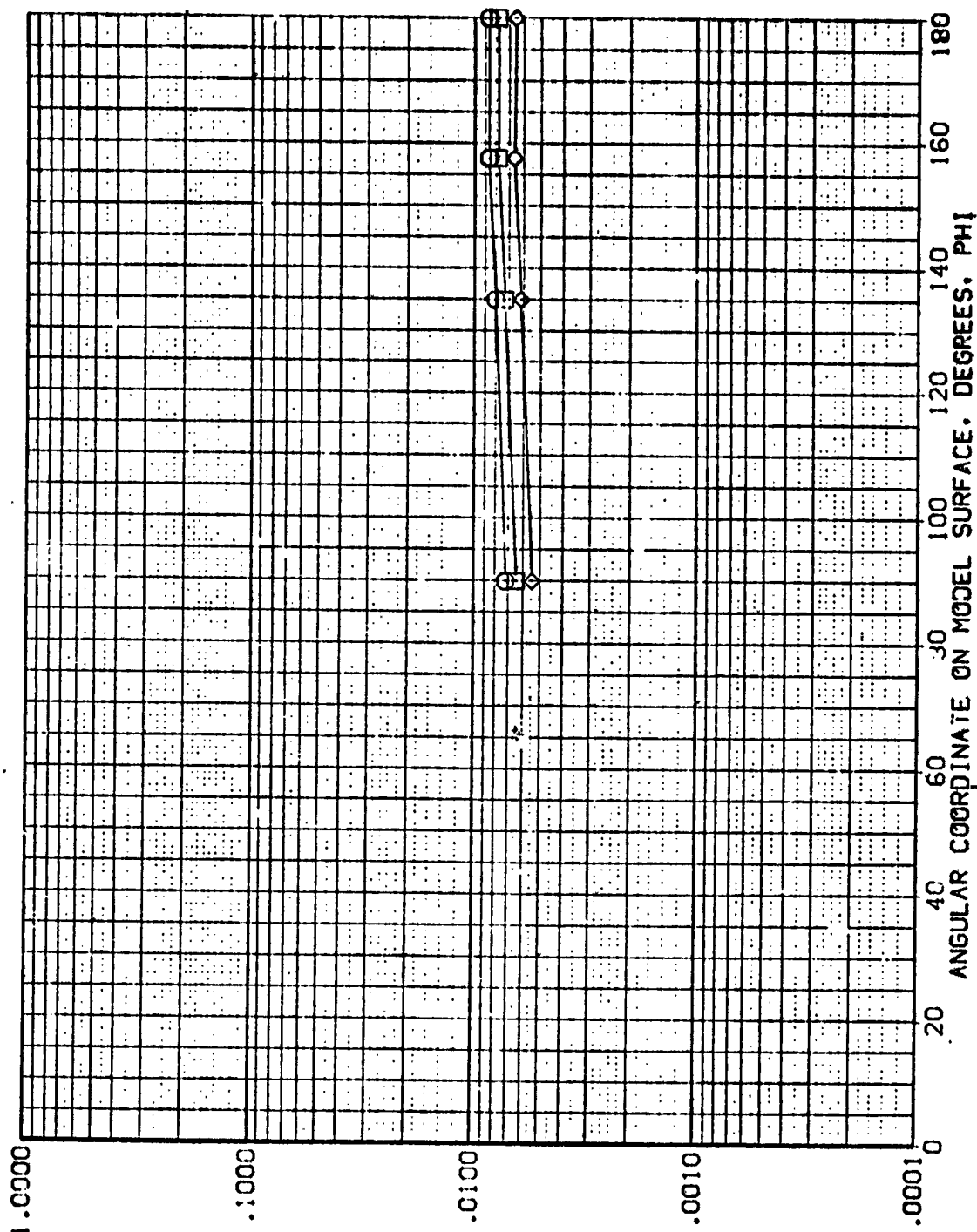


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1

EXTERNAL TANK

(REV114)

SYMBOL  
□  
◇

PAV/HT .850  
X/L .350  
MACH 5.220  
.900  
1.000

PARAMETRIC VALUES  
ALPHA -30.000  
RN/L 1.000  
BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

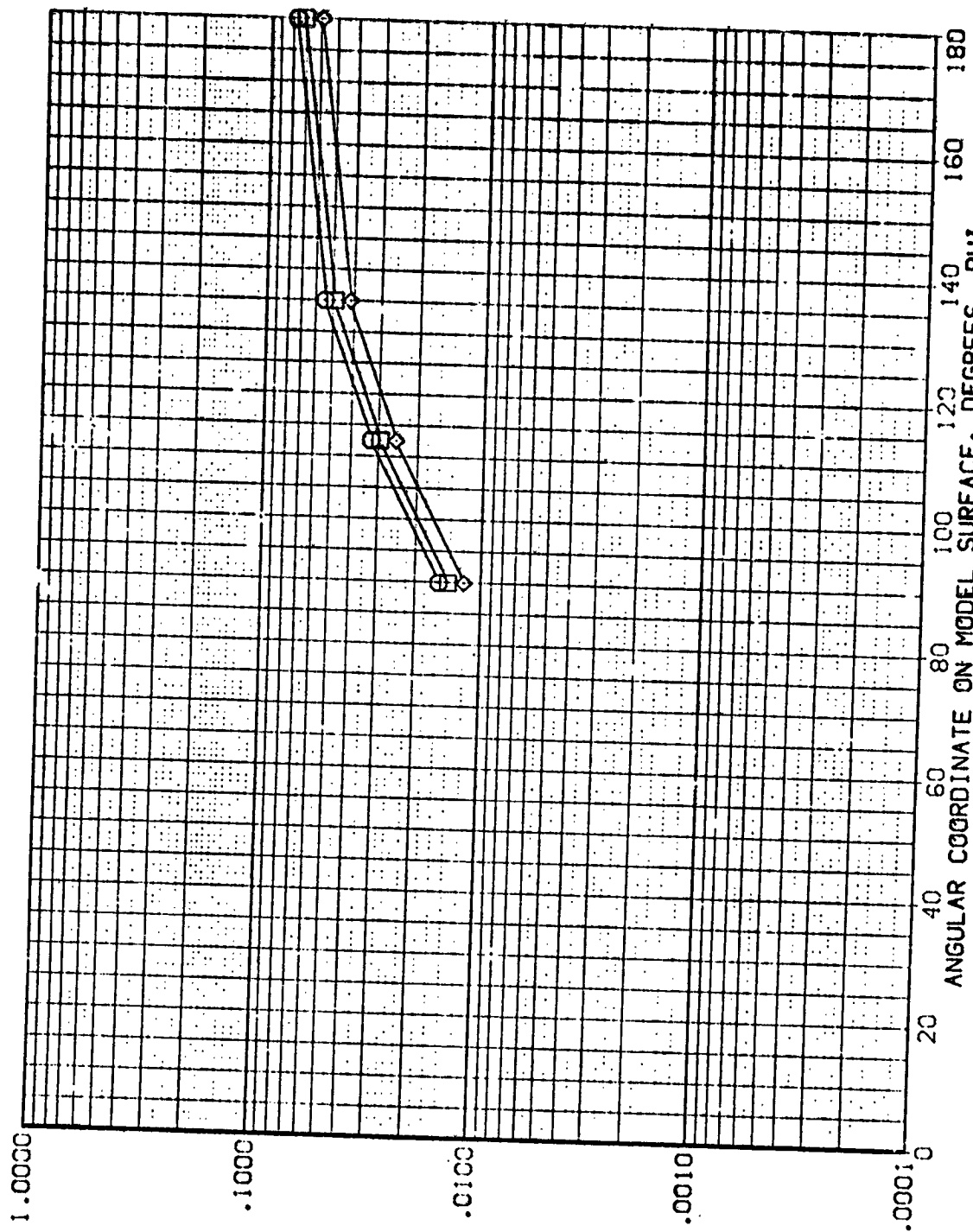


FIG. 4 TANK ALONE



AMES 3.5-195 IH28 T1

EXTERNAL TANK

(REV114)

SYMBOL

HAZ/HT .850  
X/L .400  
MACH 5.220

PARAMETRIC VALUES

ALPHA -30.000  
RN/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

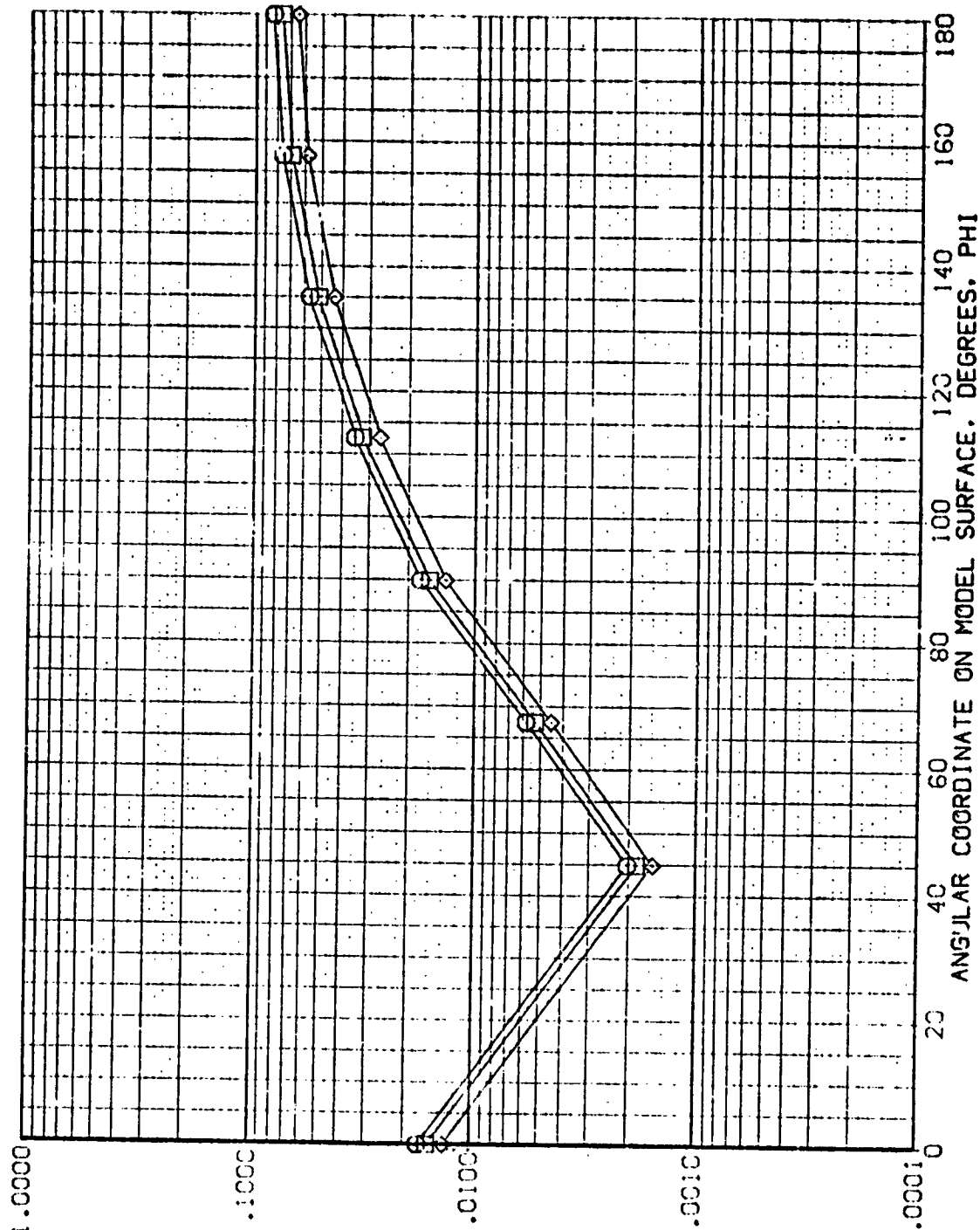


FIG. 4 TANK, ALONE

# AMES 3.5-195 1428 T1 EXTERNAL TANK

(REV 14)

SW2C  
-AW/H  
.850  
.900  
1.000

W/L .450  
MACH 5.220

PARAMETRIC VALUES  
ALPHA  
P<sub>W</sub>/L  
-30.000  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

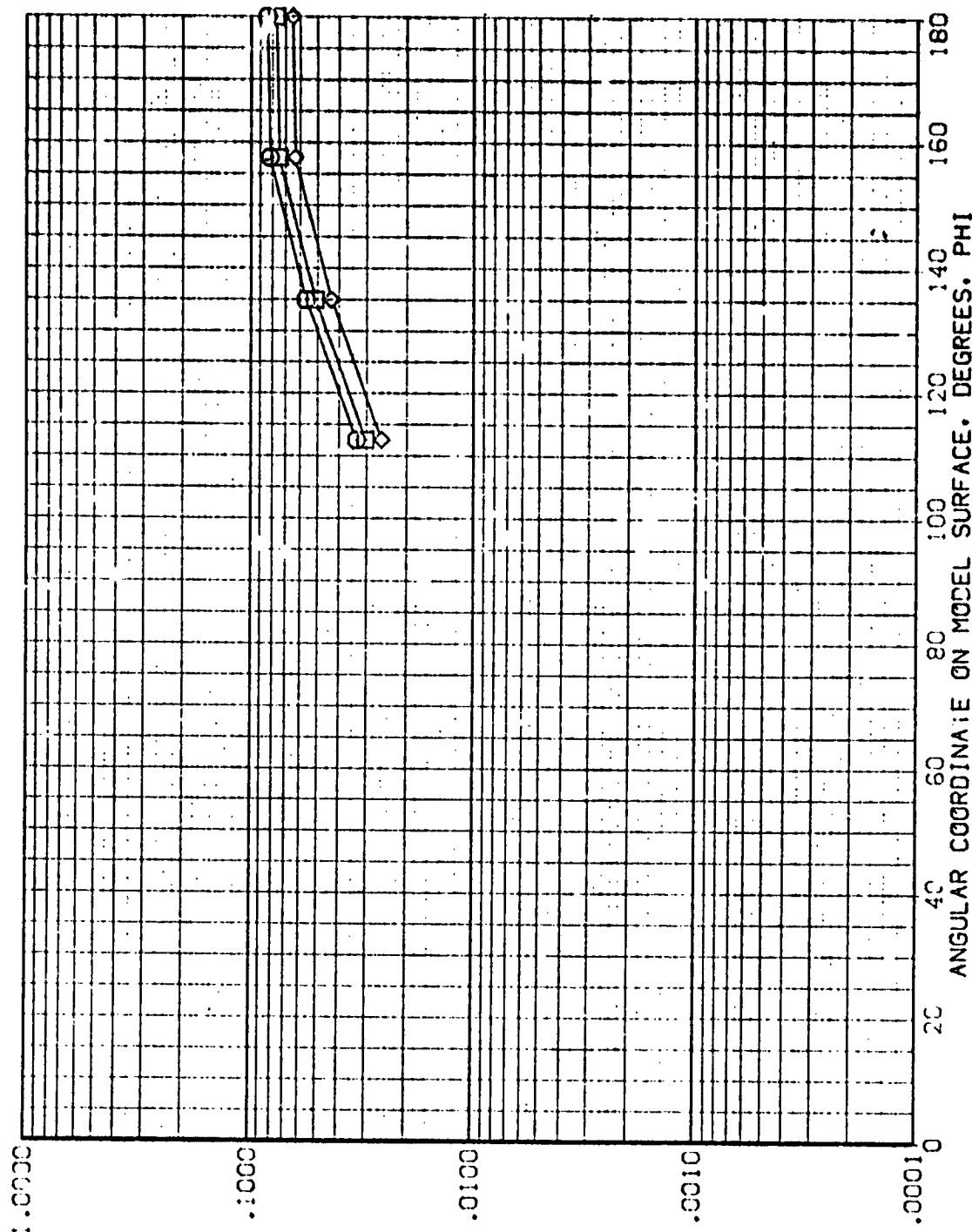


FIG. 4 TANK, ALONE

SYMBOL	HAZ/HT	X/L	MACH	PARAMETRIC VALUES
◇	.650	.500	5.220	ALPHA
□	.800			-30.000
	1.000			BETA
				1.000

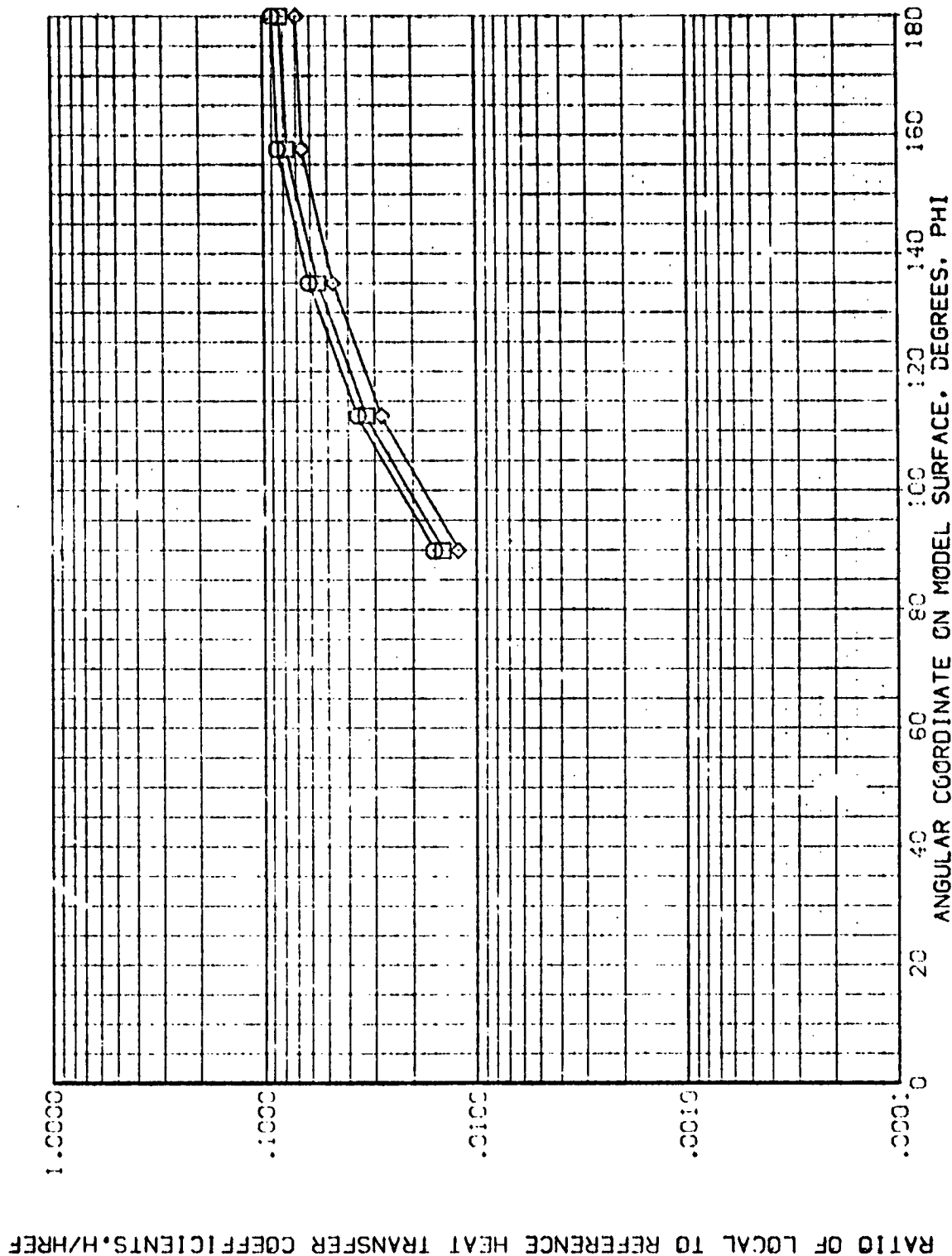


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV114)

SYMBOL

HAIR/UT

X/L

MACH

.953

.550

5.220

◇

.953

.900

1.000

PARAMETRIC VALUES

ALPHA

BETA

P1/L

1.000

1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

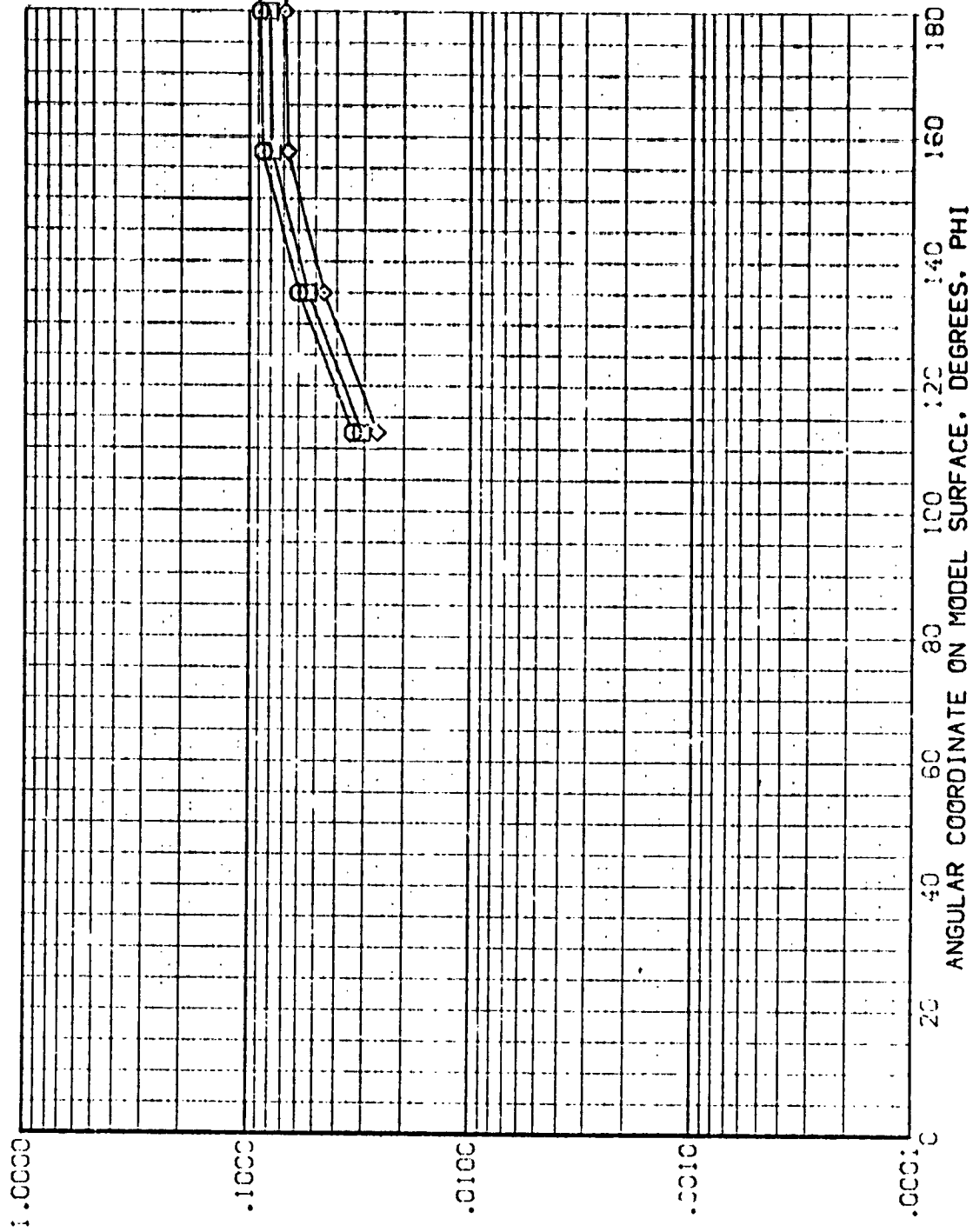


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV 14)

SYMBOL HAWK X/L MACH  
 ◇ .850  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -30.000 DEG  
 RN/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

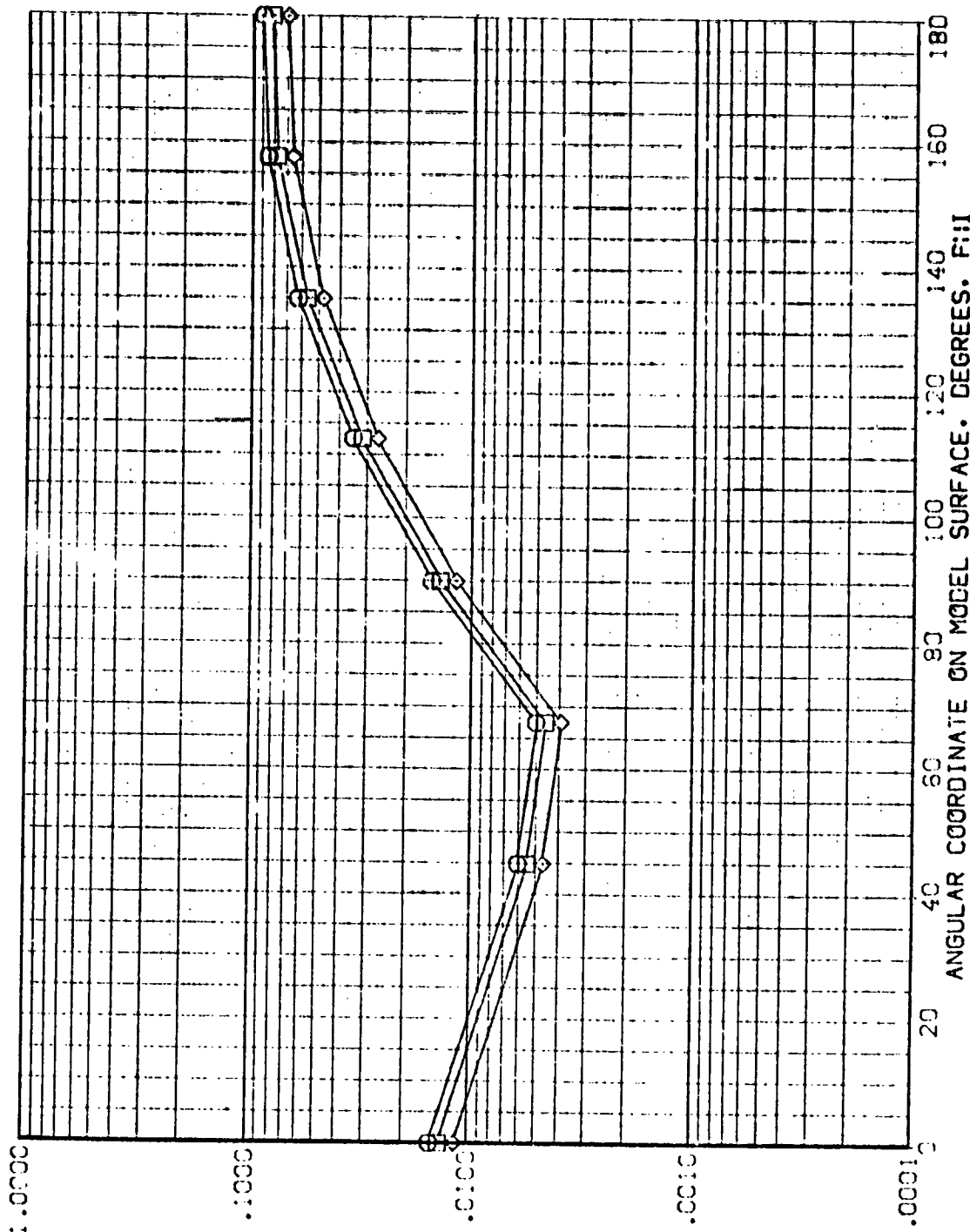


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV114)

SYMBOL

WING/HT  
.850  
.900  
1.000

X/L  
.650

WACH  
5.220

PARAMETRIC VALUES

ALPHA  
P-1/L  
-30.000  
1.000

BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

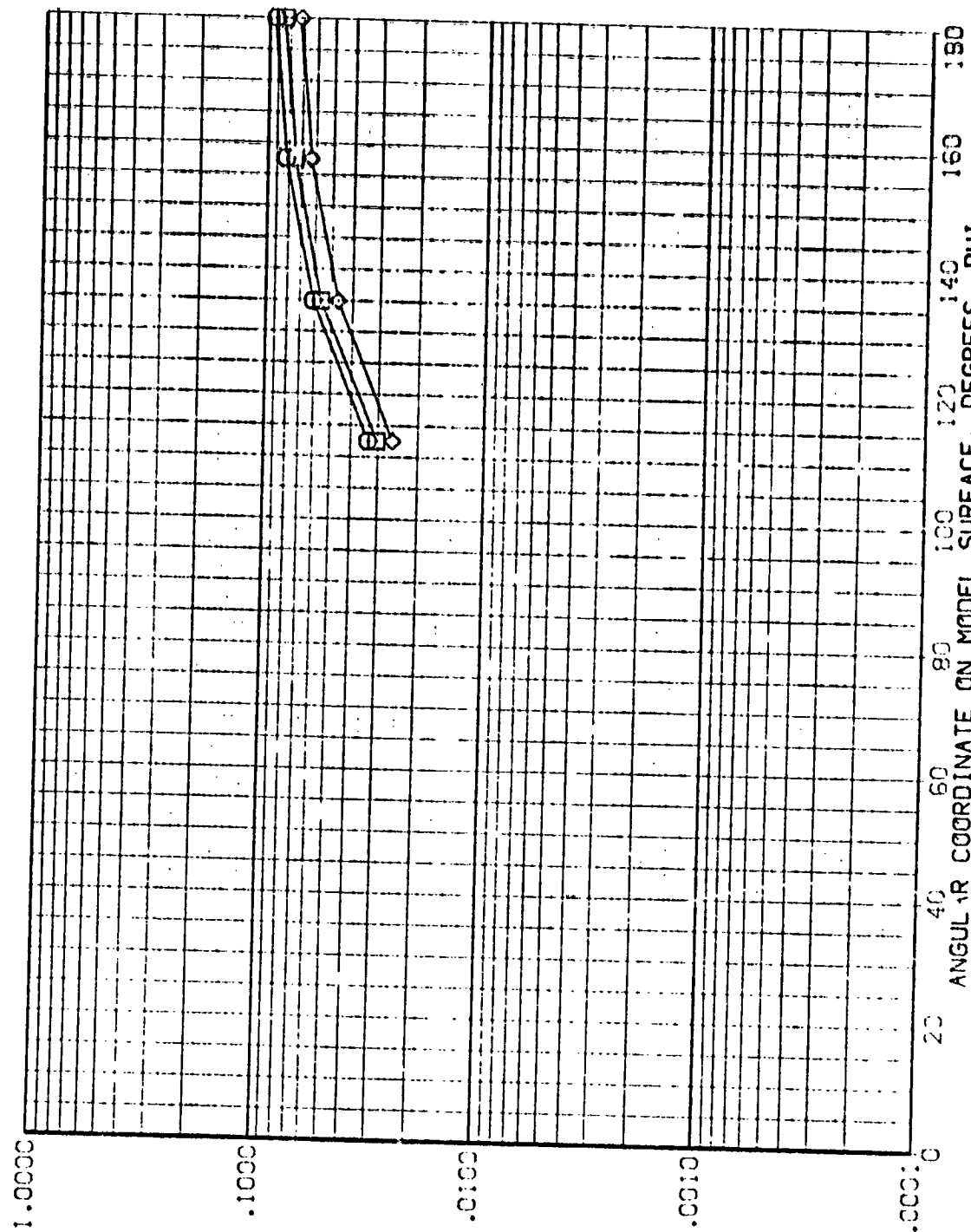


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV 14)

SVGC HAW/RT X/L MACH  
 .850 .700 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000 BETA .000  
 PVAL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

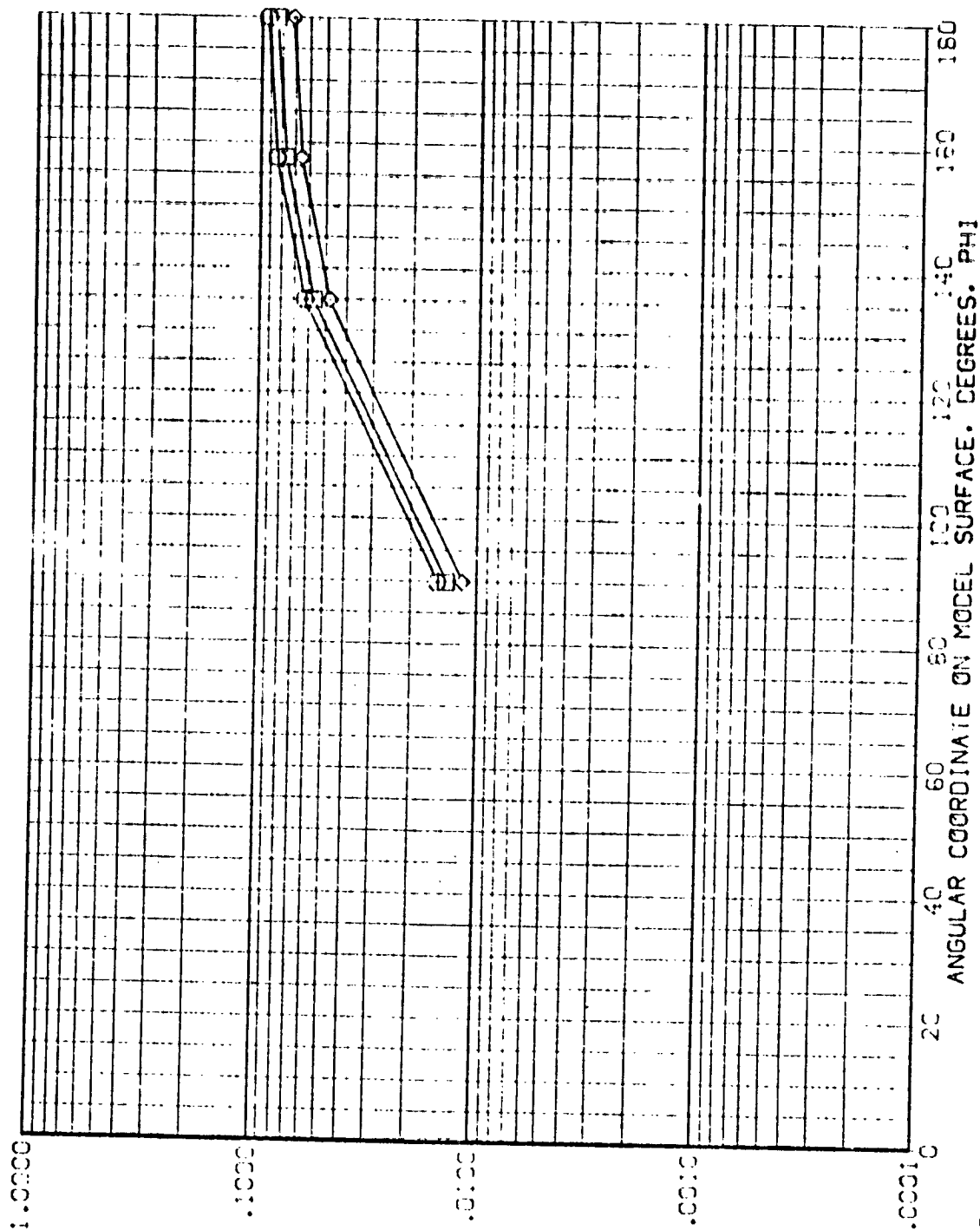


FIG. 4 TANK, ALONE

02

# AXES 3.5-195 IH28 .1 EXTERNAL TANK

(REV114)

SYMBOL  
 HAZ/AT  
 .850  
 .900  
 1.000

V/L  
 .750  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -30.000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

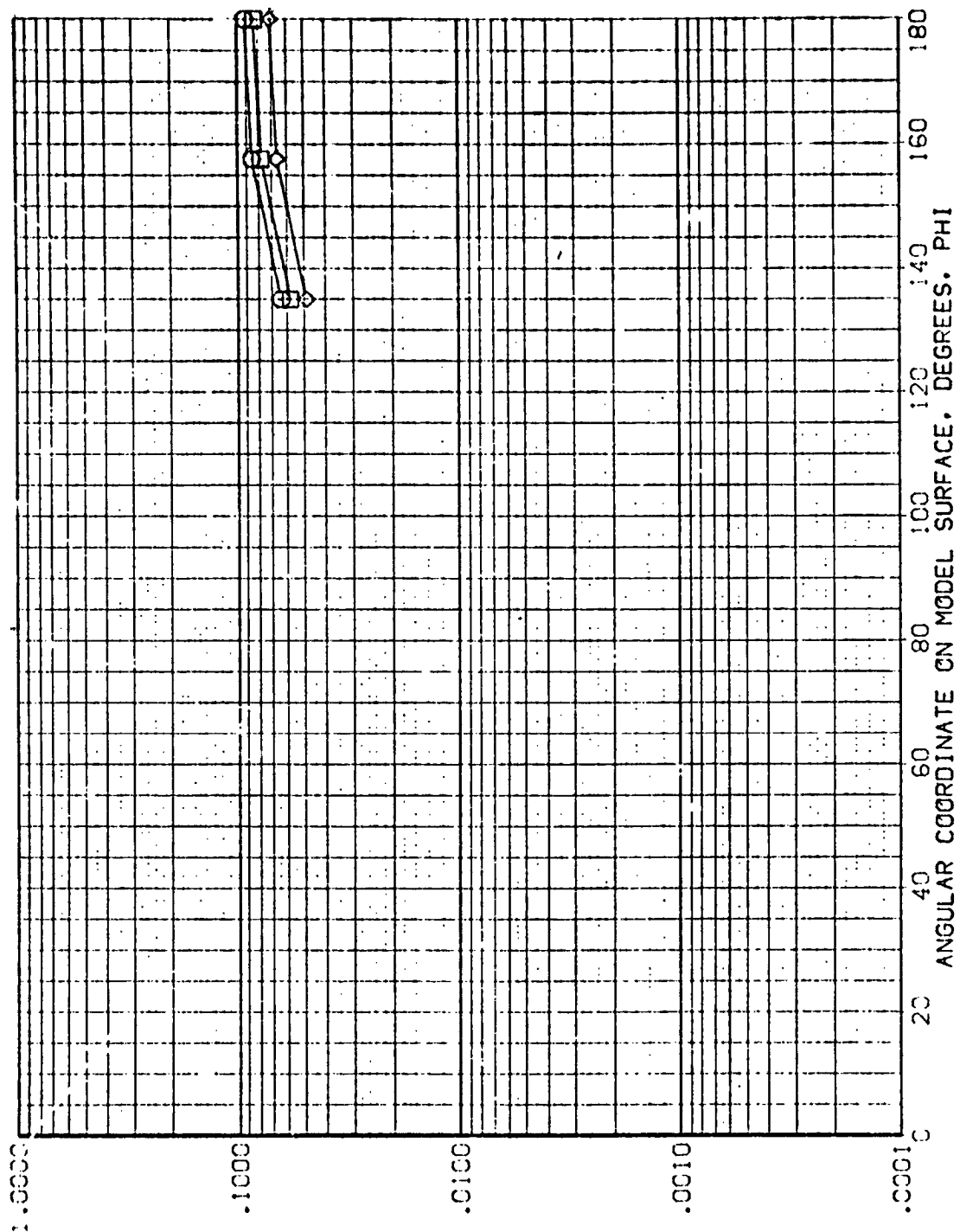


FIG. 4 TANK, ALONE



(REV114)

EXTERNAL TANK

AVES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -30.000  
RN/L 1.000  
BETA .000

SYMBOL H/W/HT X/L MACH  
◇ .850 .800 5.220  
□ .900  
○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

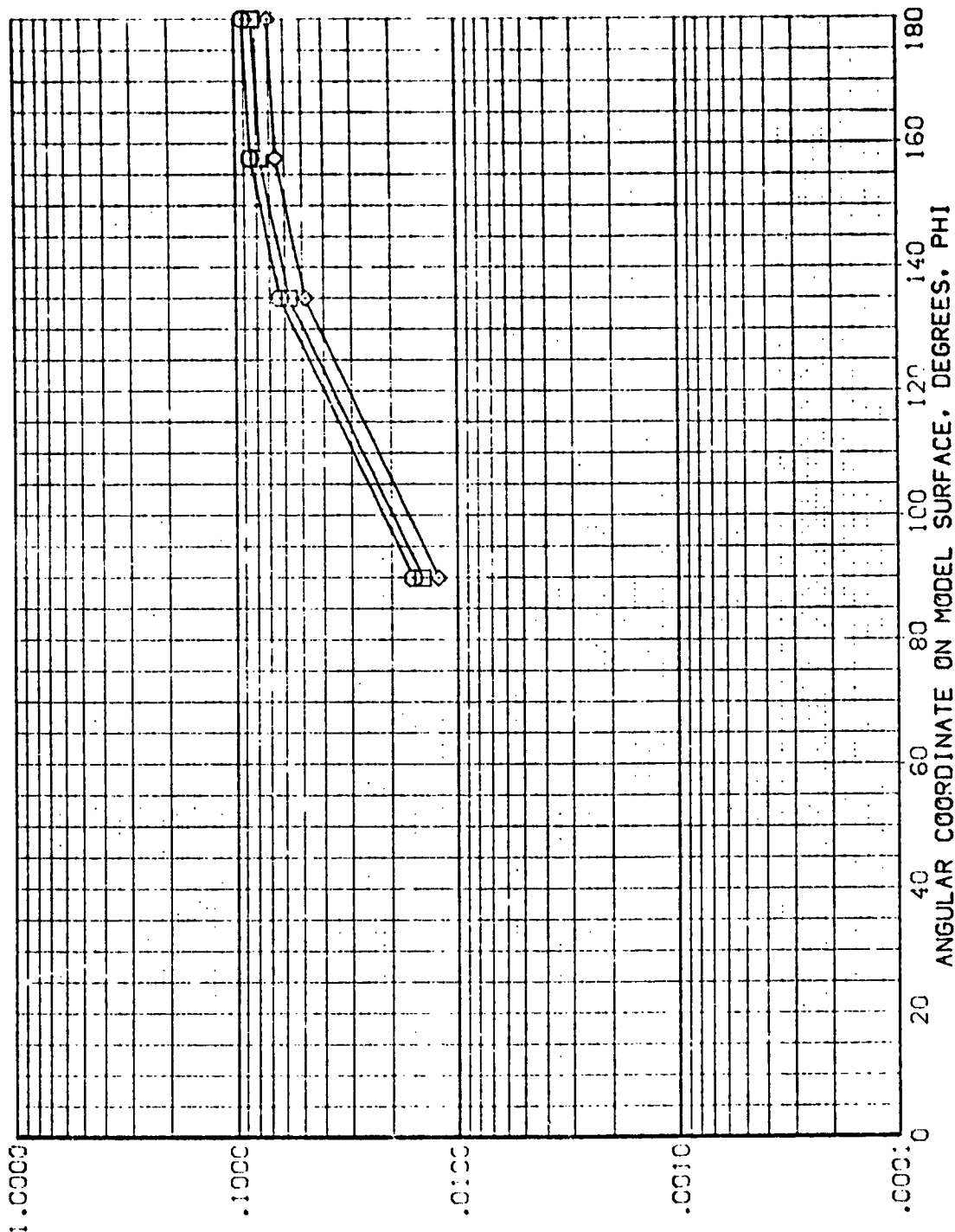


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV 14)

SYMBOL

HAW/HT  
.850  
.930  
1.000

X/L  
.850

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
PV/L  
-30.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

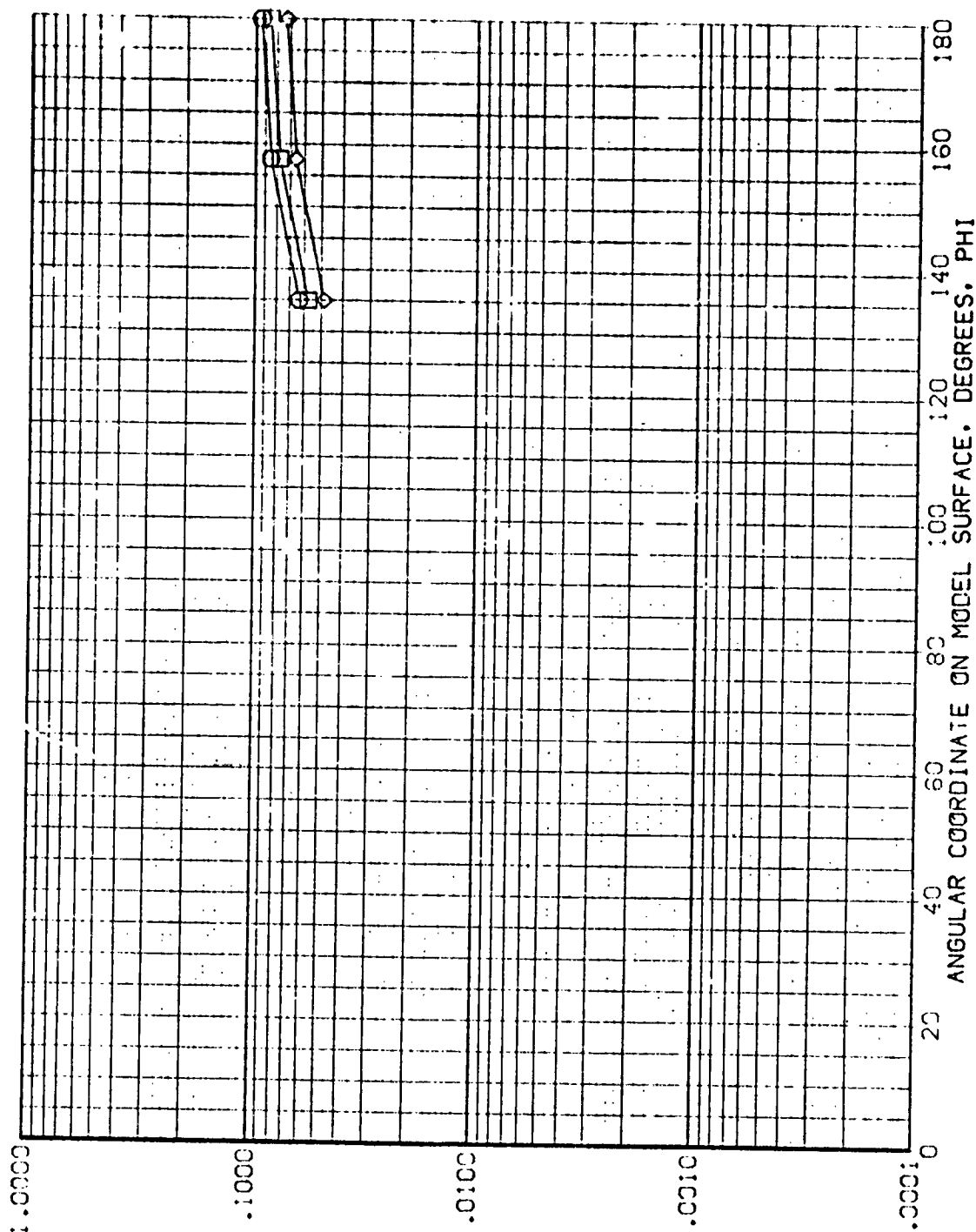


FIG. 4 TANK ALONE

AMES 3.5-195 1428 T1

EXTERNAL TANK

(REV114)

SVRCL	WAVE/WT	Y/L	MACH	ALPHA	PARAMETRIC VALUES
0.170	.850	.900	5.220	RN/L	-30.000 BETA
	.900				1.000
	1.000				.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

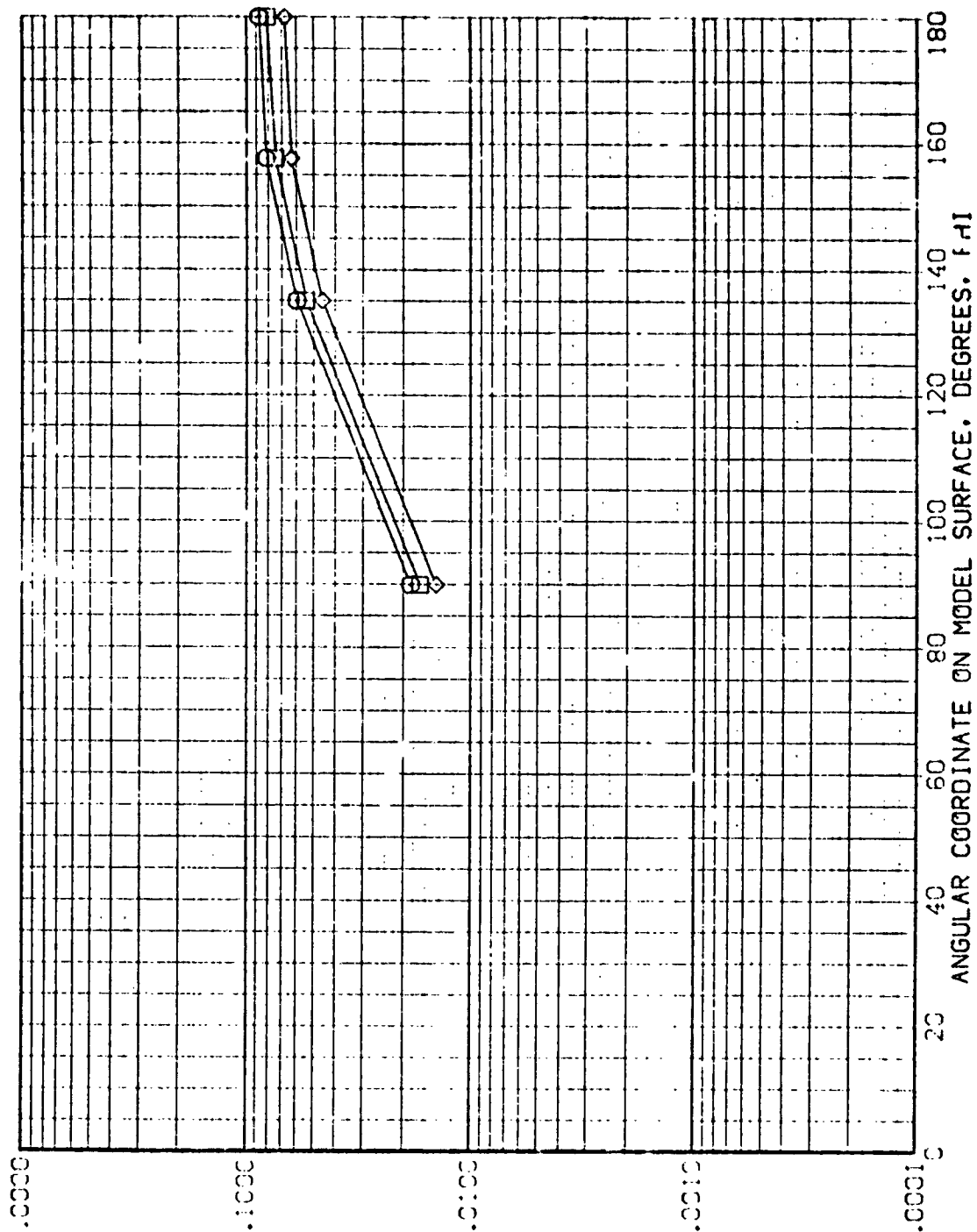


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV115)

SYMBOL H/W/T X/L MACH  
 ◇ .850 .350 5.221  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

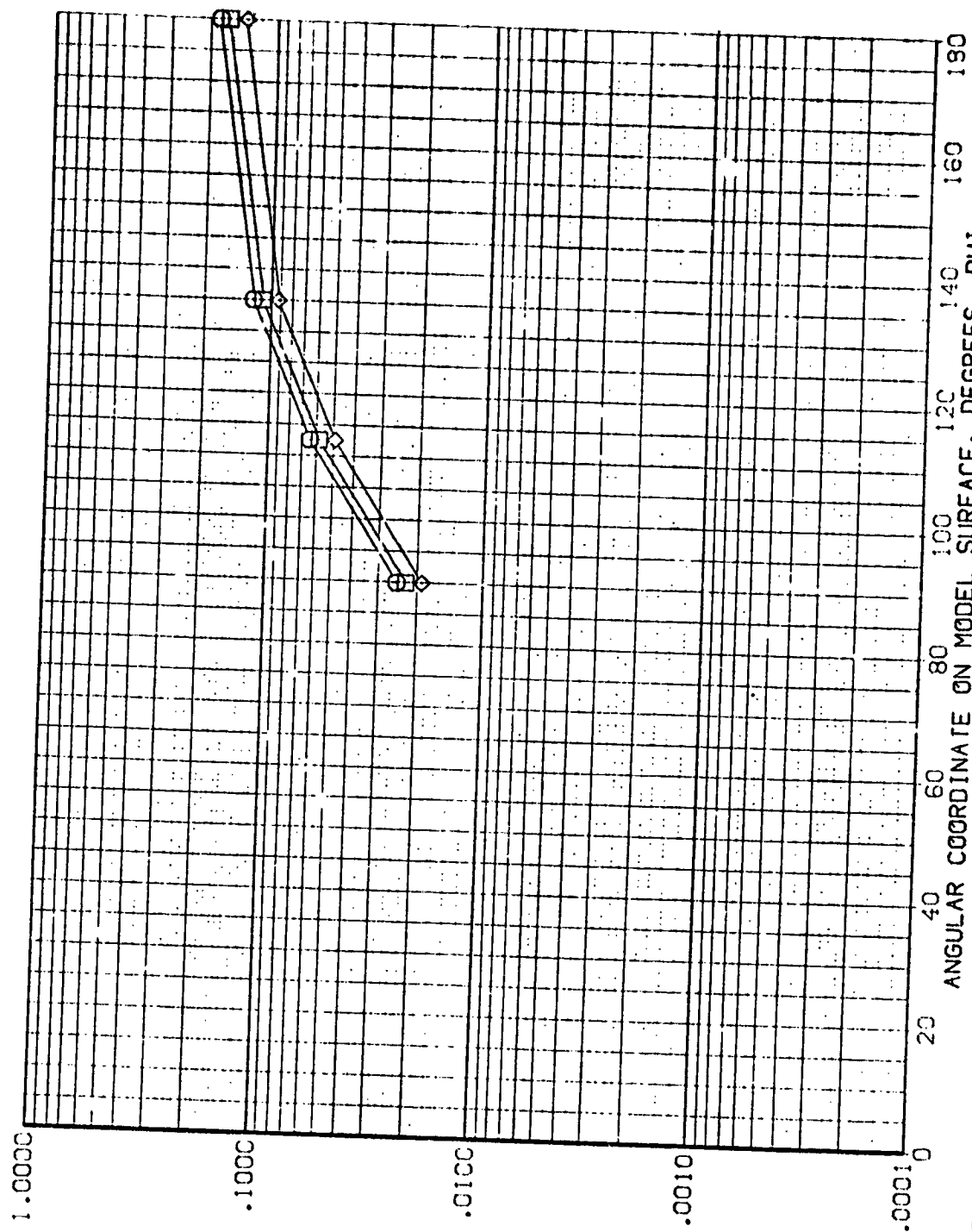


FIG. 4 TANK, ALONE

(REV15)

EXTERNAL TANK

AMES 3-5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -50.000 BETA .000  
R/N/L 1.000

SYMBOL HAW/HT X/L MACH  
◇ .850 .400 5.221  
○ .950  
□ 1.000

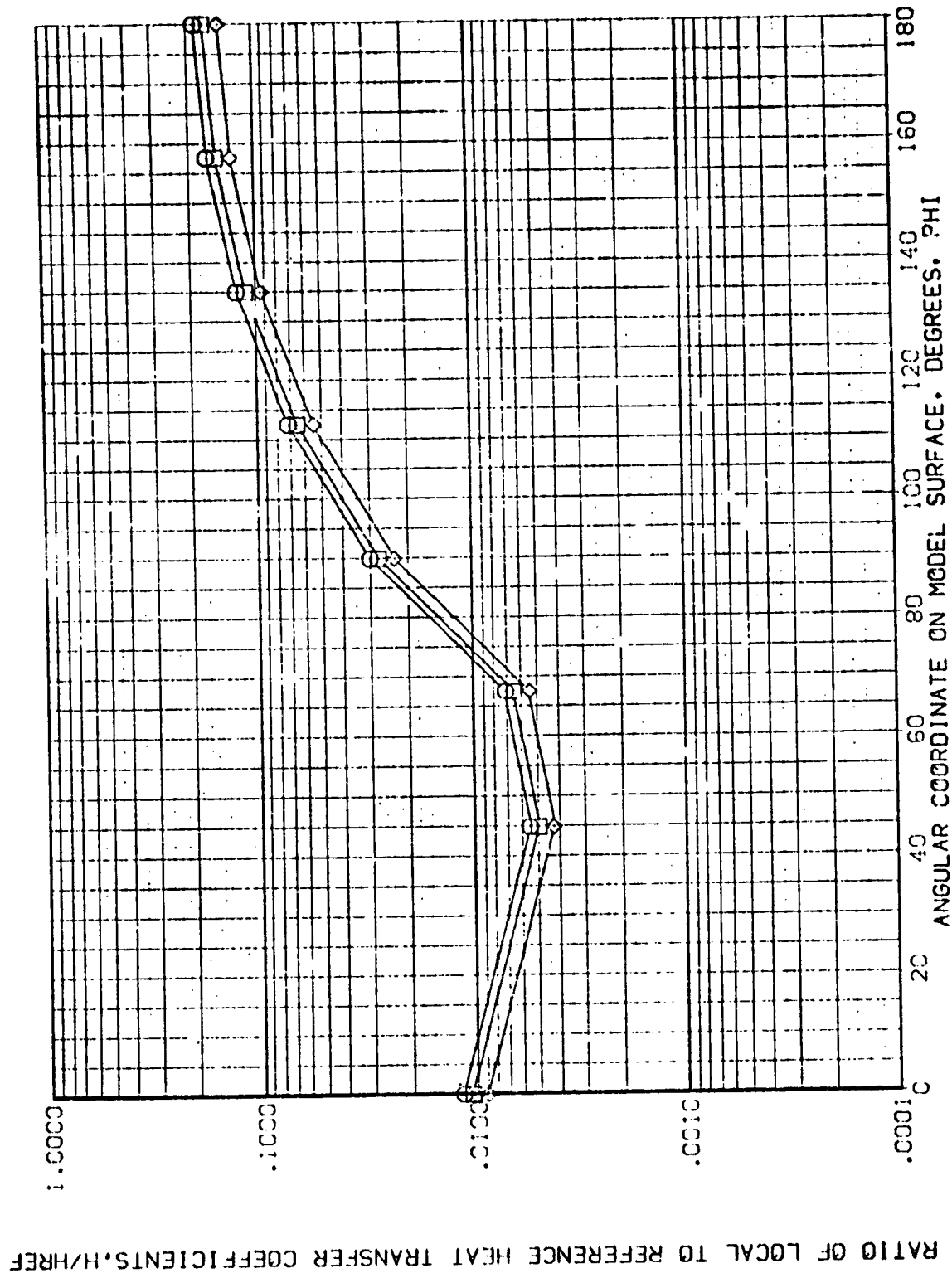


FIG. 4 TANK, ALONE

(REV15)

PARAMETRIC VALUES	
ALPHA	BETA
RN/L	
-60.000	1.000
	.000

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SWBC	HAW/HT	X/L	MACH
	.850	.450	5.221
	.900		
	1.000		

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

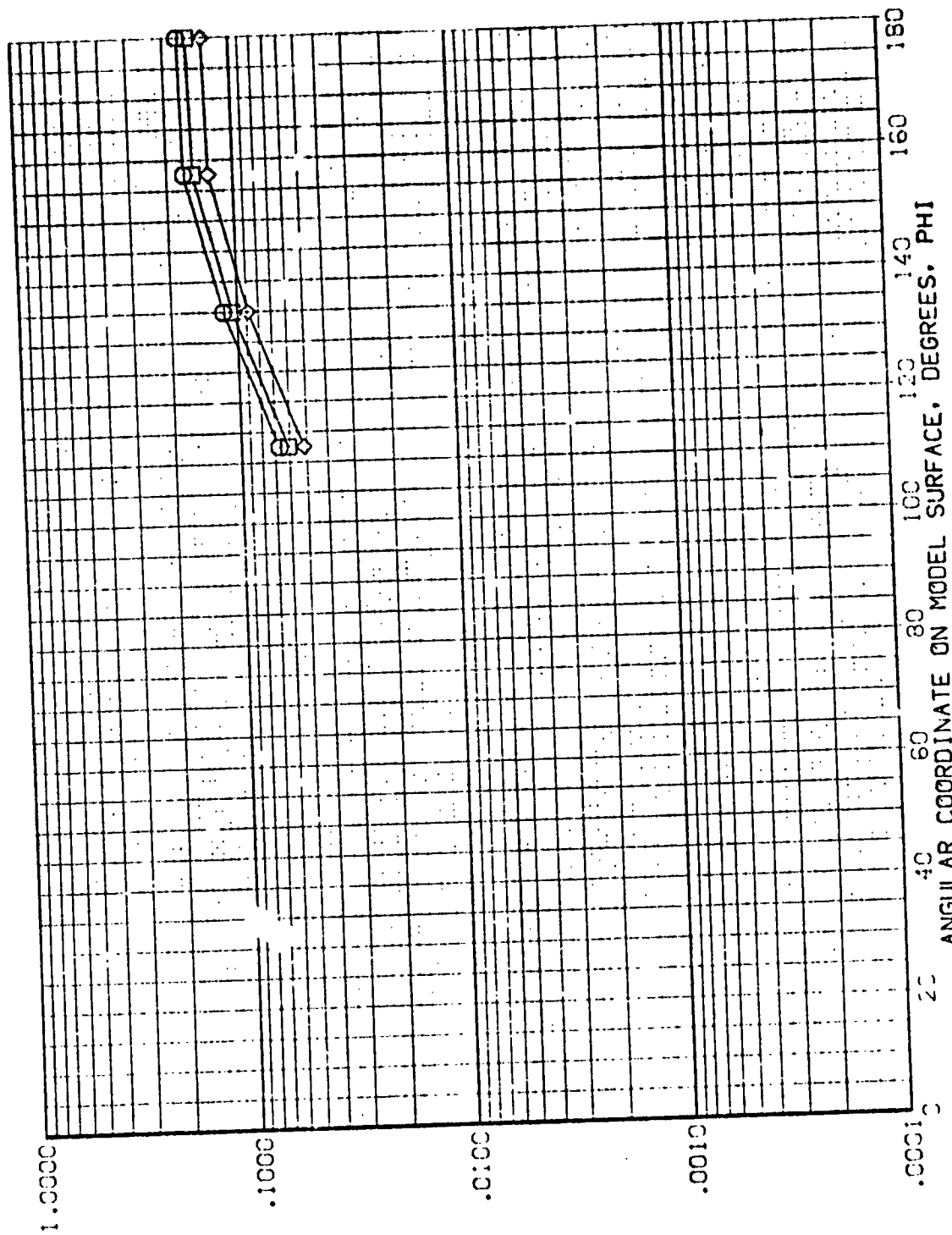


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV15)

SYMBOL

WALL/HT

X/L

MACH

.850  
.900  
1.000

ALPHA  
R/L

PARAMETRIC VALUES  
-60.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

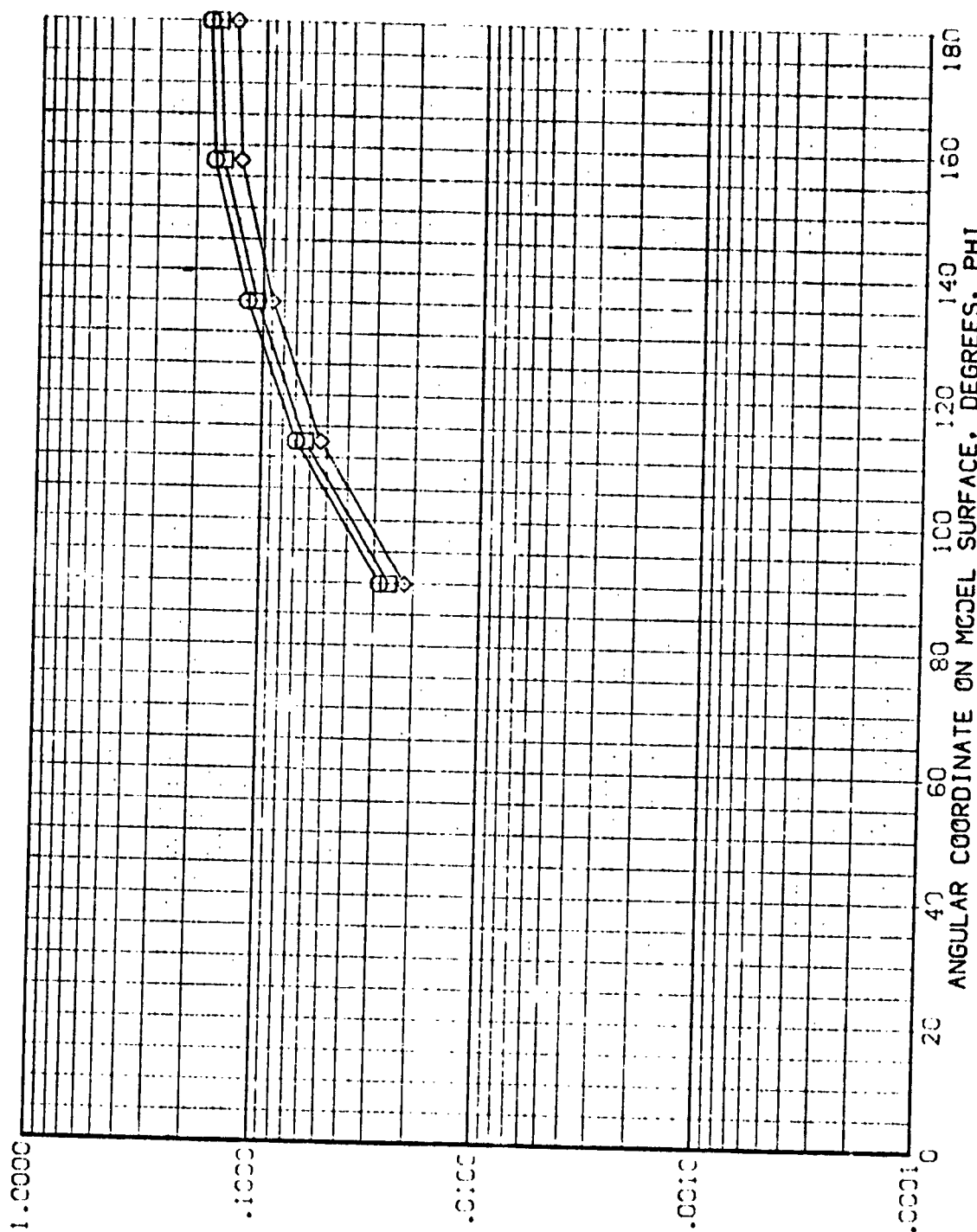


FIG. 4 TANK, ALONE

AMES 2.5-195 1428 T1      EXTERNAL TANK      (REV15)  
 PARAMETRIC VALUES  
 ALPHA      BETA      .000  
 R<sup>2</sup>/L      1.000

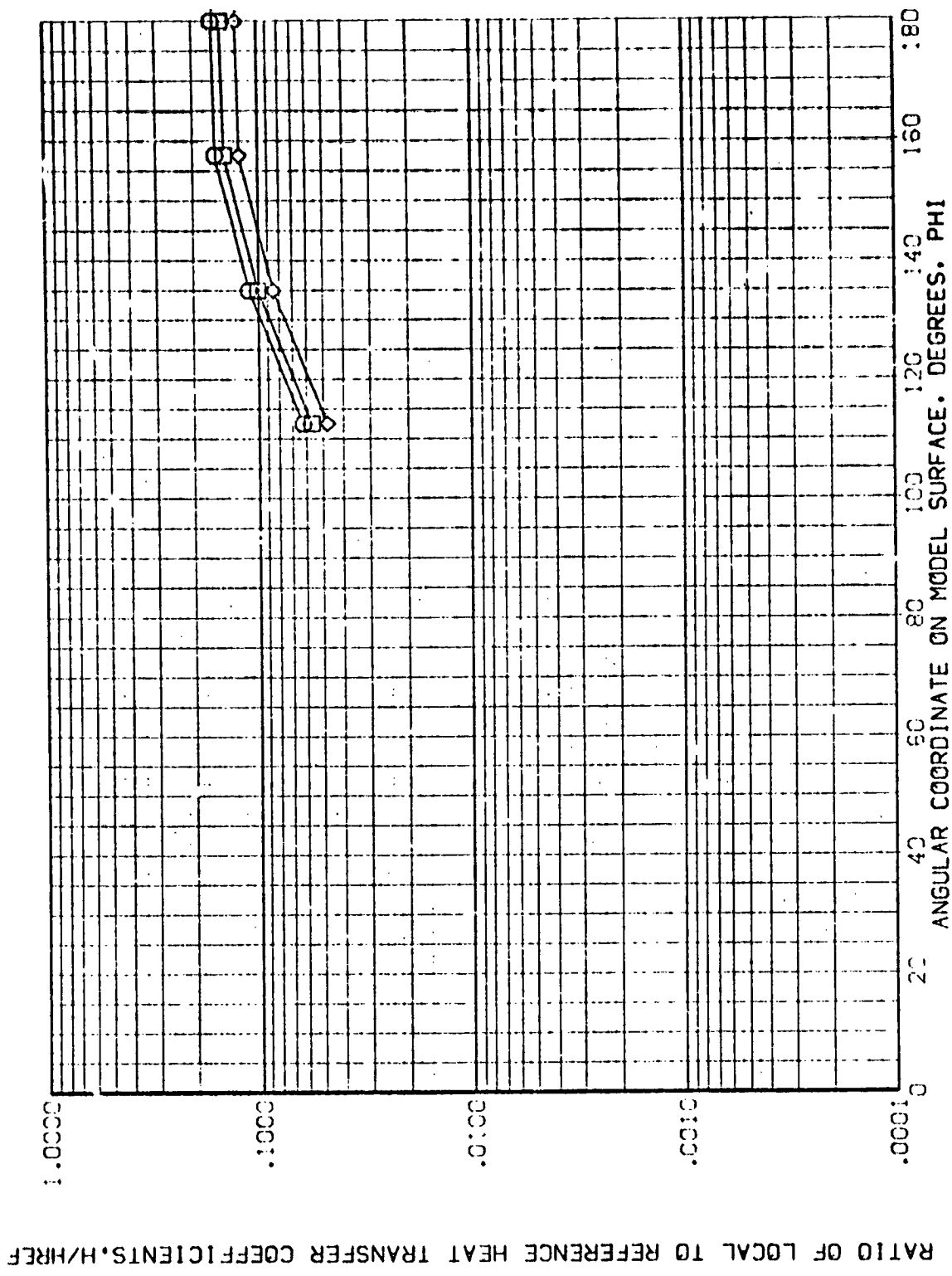


FIG. 4 TANK ALONE



# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV:15)

SYMBOL

HAM/HT

X/L

MACH

.850

.600

5.221

.900

1.000

PARAMETRIC VALUES

ALPHA

-50.000

BETA

.000

RM/L

1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

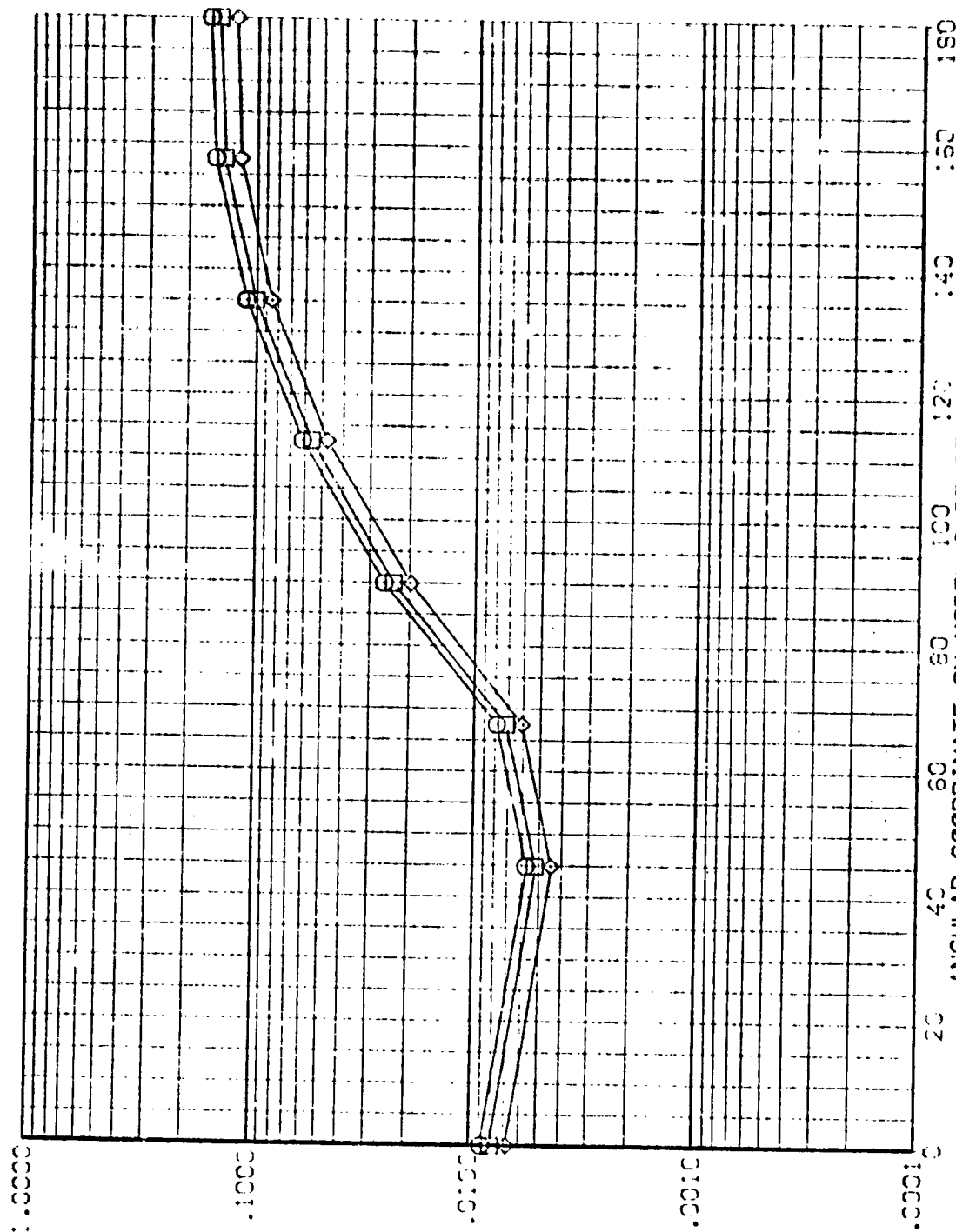


FIG. 4 TANK, ALONE

AVES 3.5-195 1428 T1 EXTERNAL TANK (REV15)  
 PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 PA/L 1.000  
 SYM32- WAK/L Y/L MACH  
 .850 .500 5.221  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

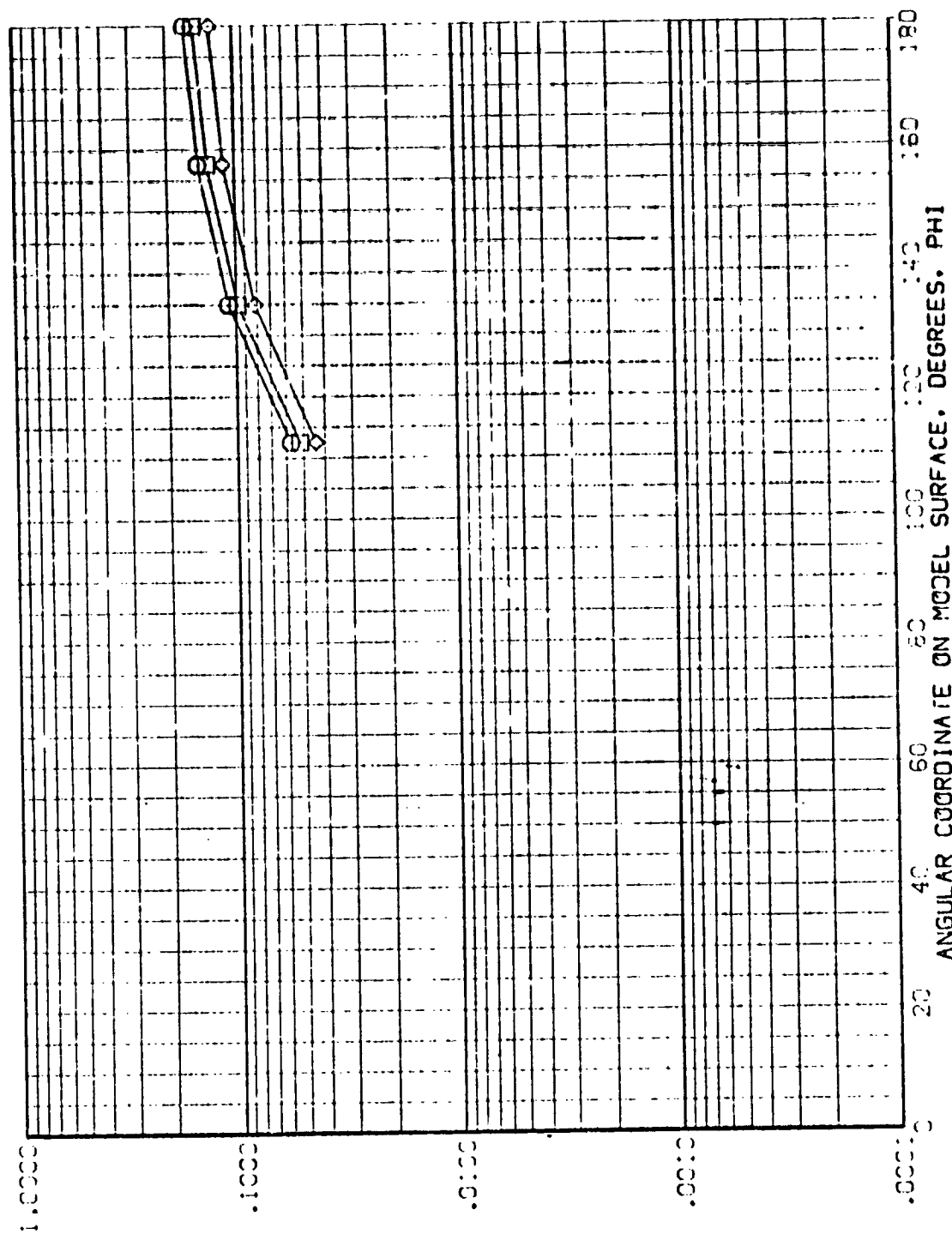


FIG. 4 TANK, ALONE

CRE/T150

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SAVEC-  
Q170

WIND/HT X/L MACH  
.850 .700 5.221  
.900  
1.000

PARAMETRIC VALUES  
ALPHA -60.000 DEGREE  
PR/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

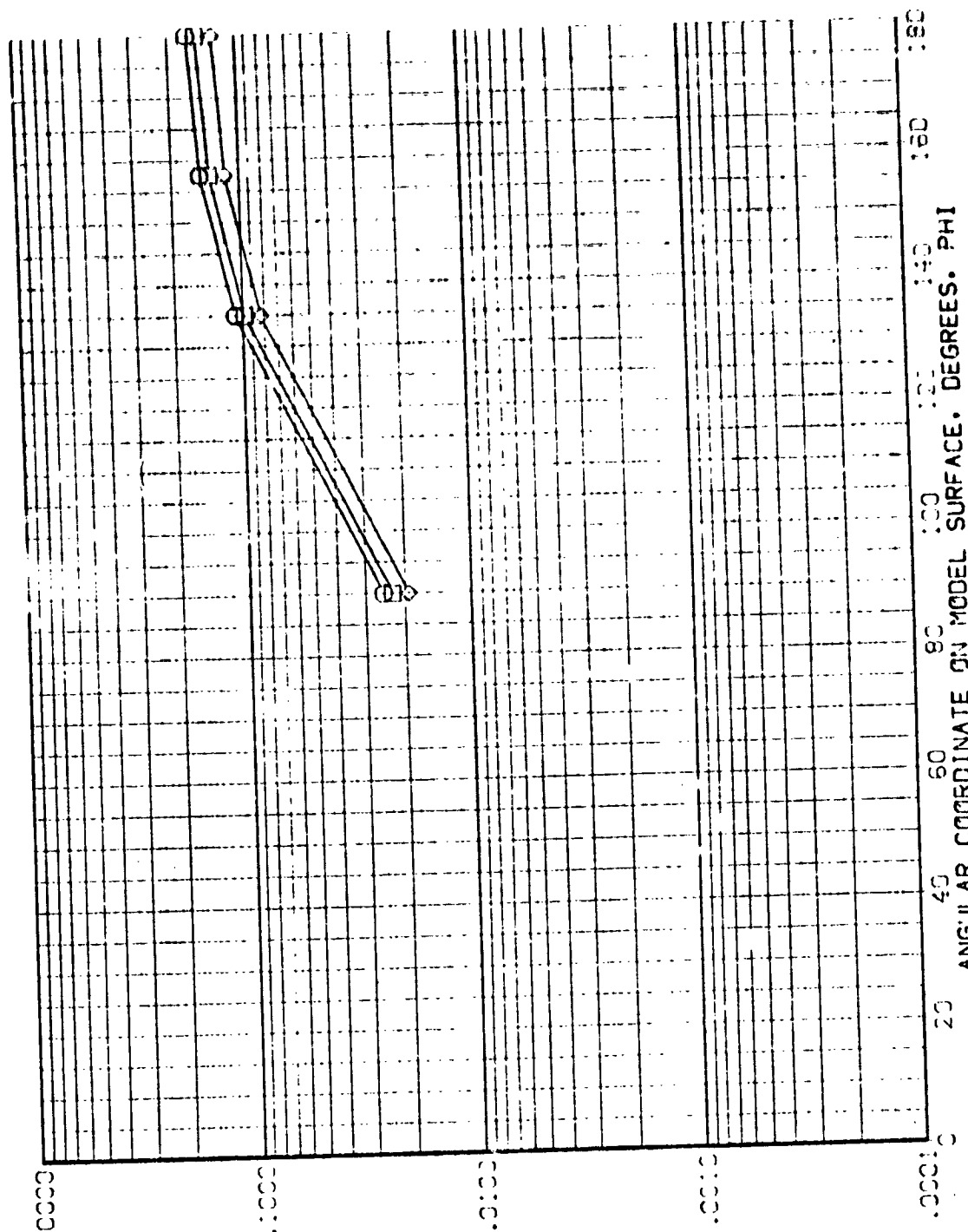


FIG. 4 TANK ALONE

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>  
 SLOPE: 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000  
 W/2: 1.750 5.000 5.000  
 AVER 3.5-1.95 1429 71 EXTERNAL TANK  
 (REF. 110)  
 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000  
 1.0000 1.5000 2.0000 2.5000 3.0000 3.5000 4.0000 4.5000 5.0000

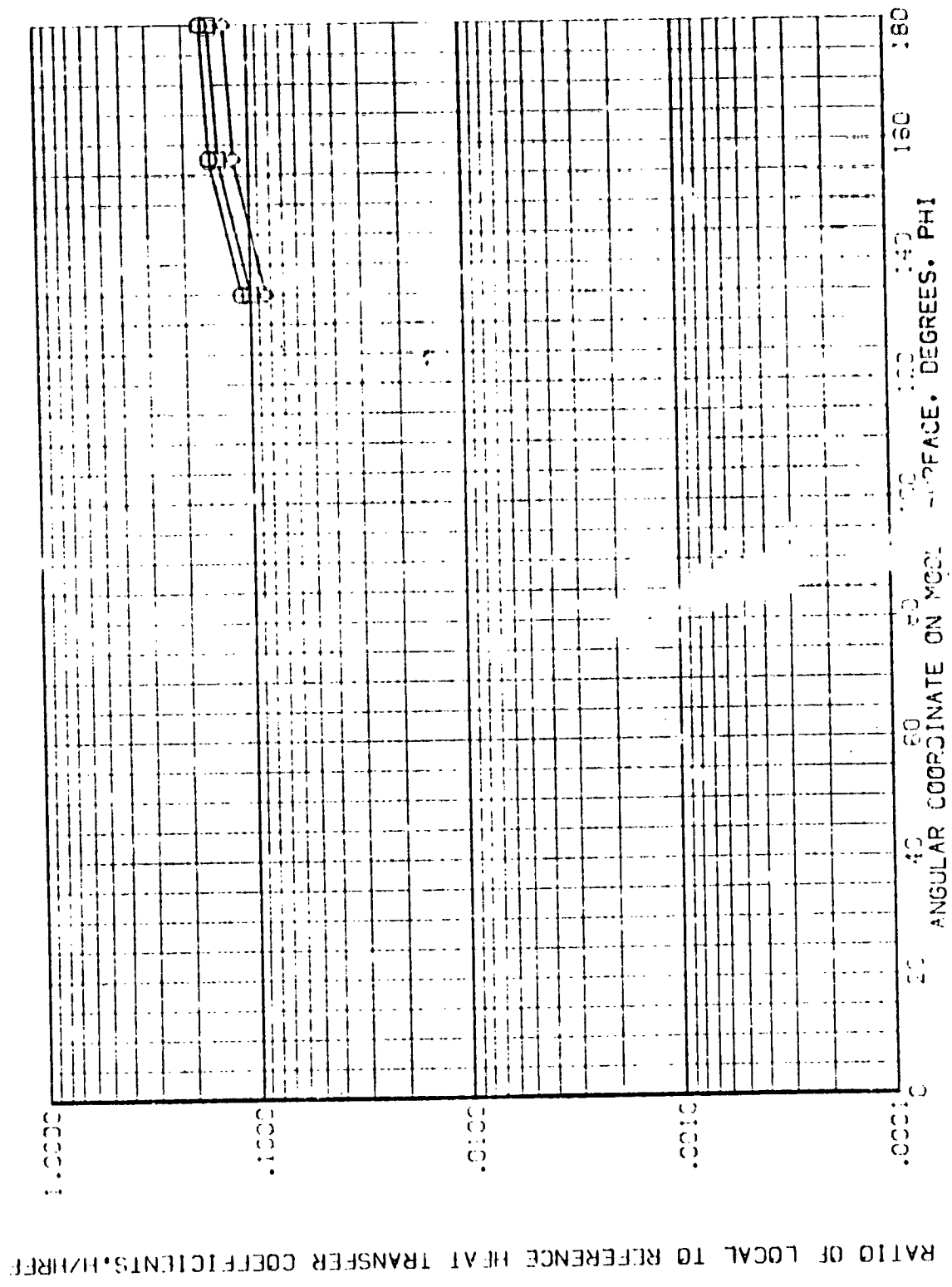


FIG. 4 TANK ALONE

# EXTERNAL TANK

AMES 3.5-195 IH28 T1

(REV115)

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .900 5.221  
 ○ .920  
 △ 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 PHI/L 1.000

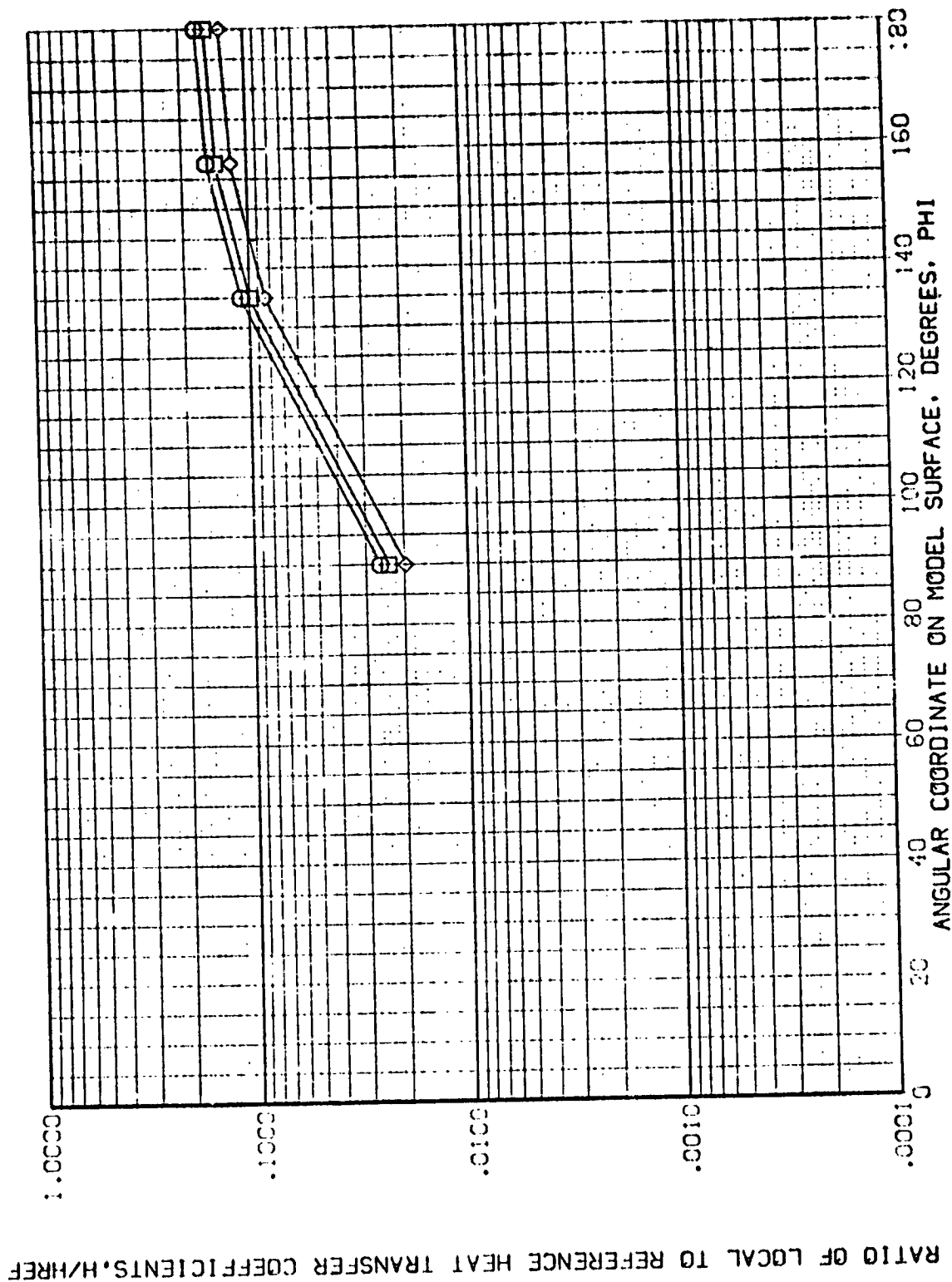
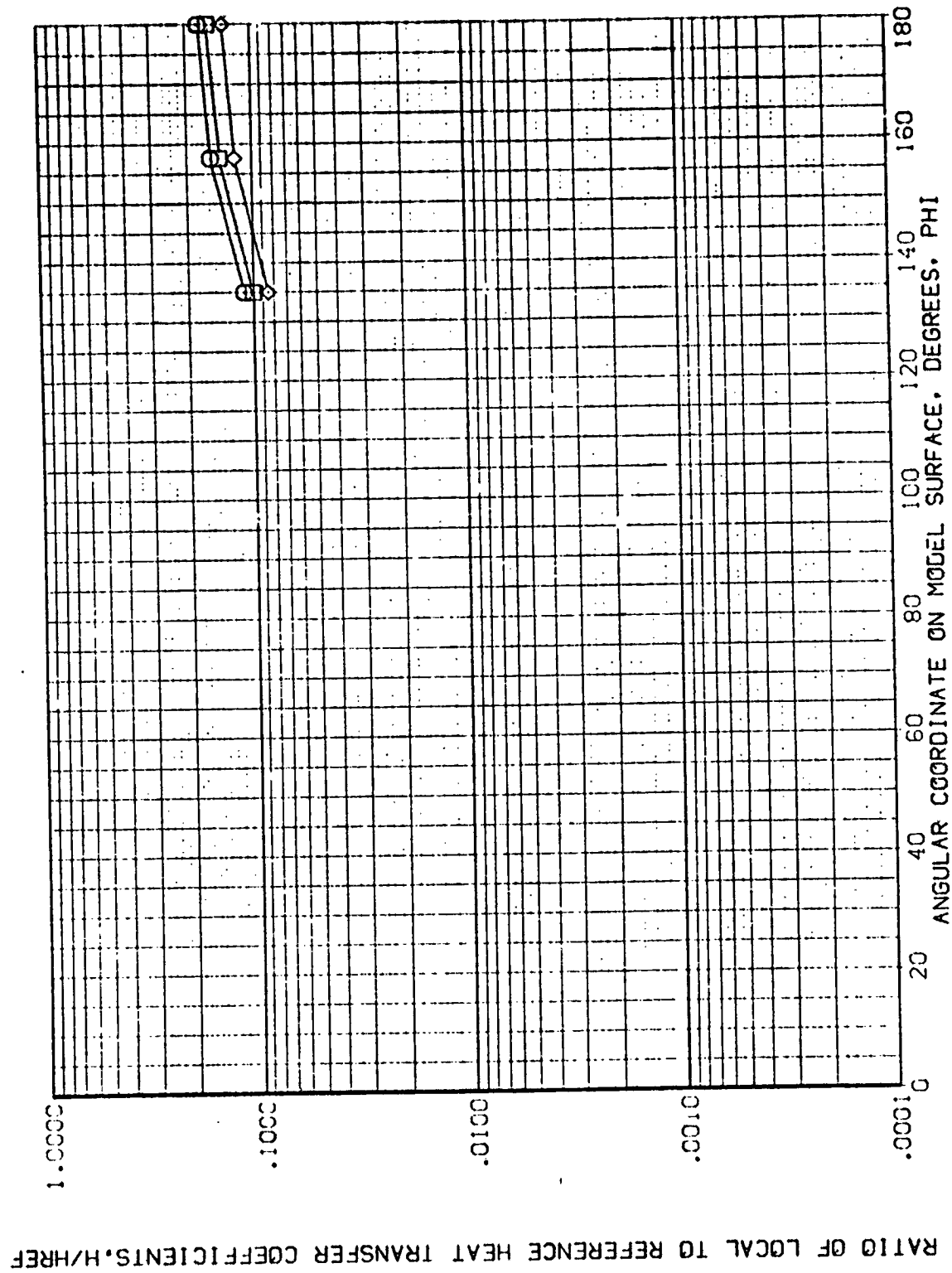


FIG. 4 TANK ALONE

AVES 3.5-:95 IH28 T1 EXTERNAL TANK

(REV 15)

SYNOPSIS	HA/W/10	V/L	MACH	ALPHA	PARAMETRIC VALUES
1.000	.850	.550	5.22	R/V/L	BETA
1.000	.800				-50.000
1.000					1.000
					.000



(REV115)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYMBOL  
◇ □ ○

H/H<sub>REF</sub> X/L MACH  
.850 .900 9.221  
.900 1.000

PARAMETRIC VALUES  
-60.000 BETA  
1.000

ALPHA  
RV/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

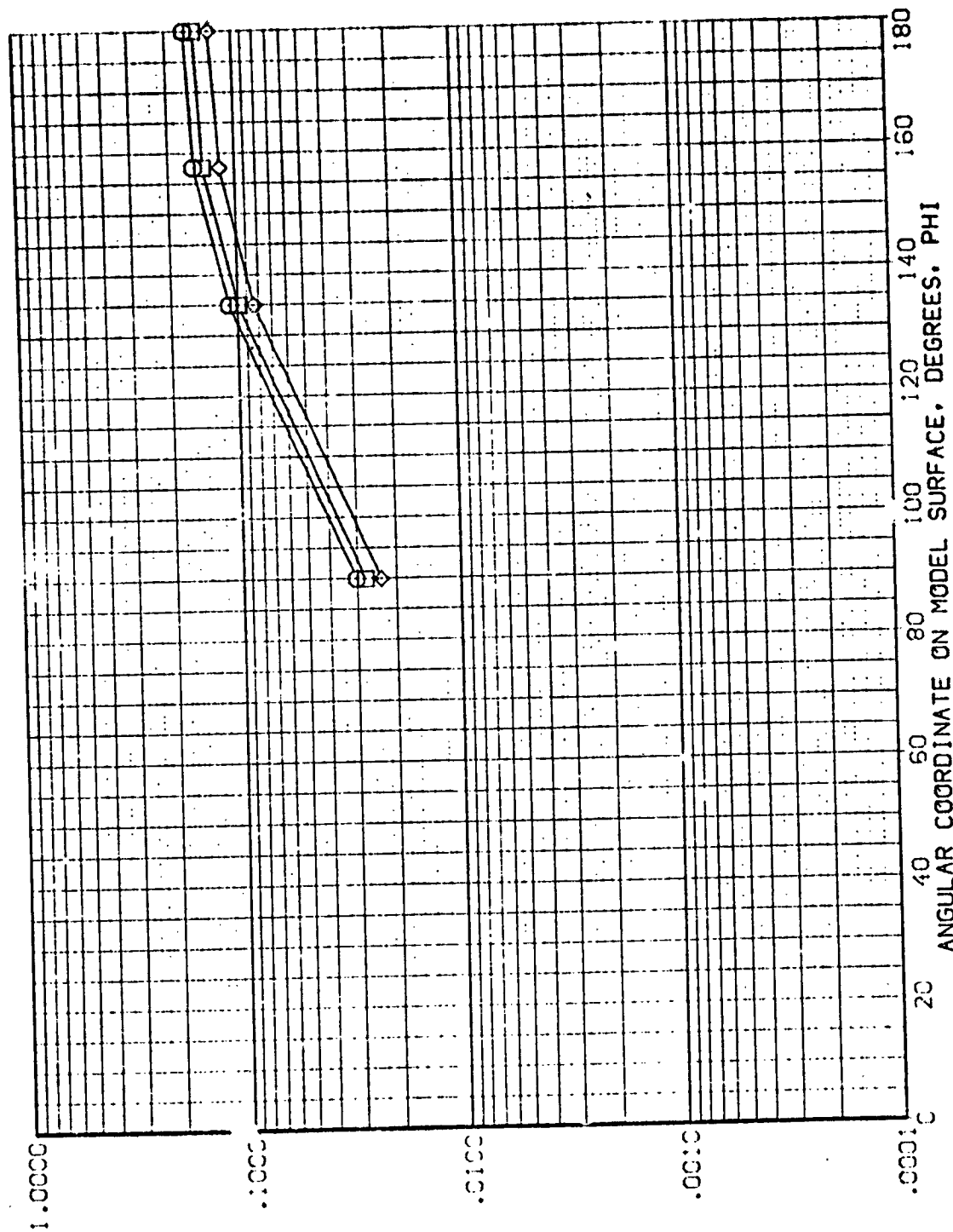


FIG. 4 TANK, ALONE

AVES 3.5-.95 1428 T1 EXTERNAL TANK

(REV T16)

SVES:  $\diamond$   $\square$   $\circ$

W/L .850 .900 1.000  
X/L .350 5.220

PARAMETRIC VALUES  
ALPHA  $\beta$   $\gamma$   
RV/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

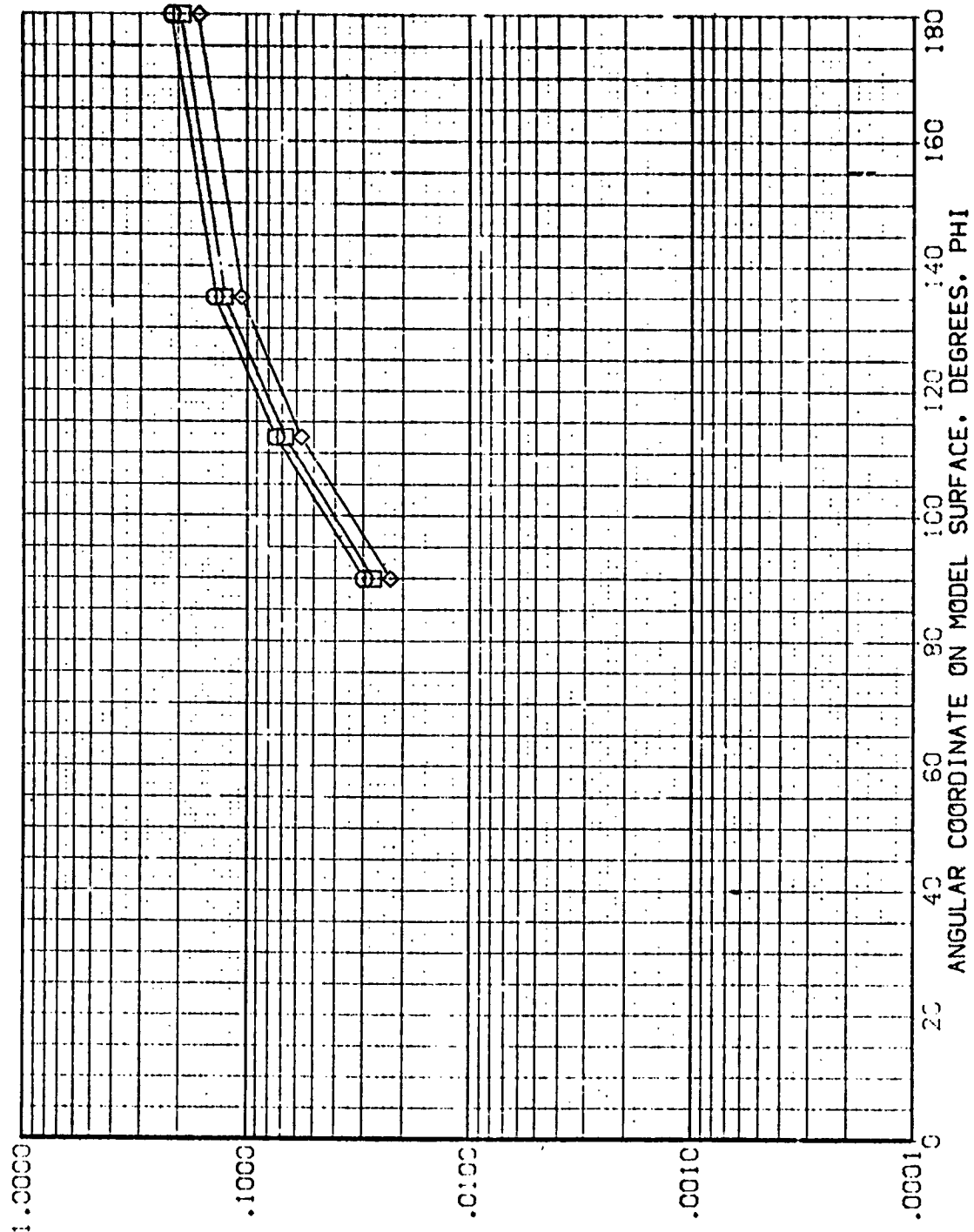


FIG. 4 TANK ALONE



(REVT16)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYMBOL		HAW/HT		X/L	MACH	PARAMETRIC VALUES		
						ALPHA	-90.00°	BETA
◇	0.170	.850	.400	5.220		P4/L	1.000	.000
		.900						
		1.000						

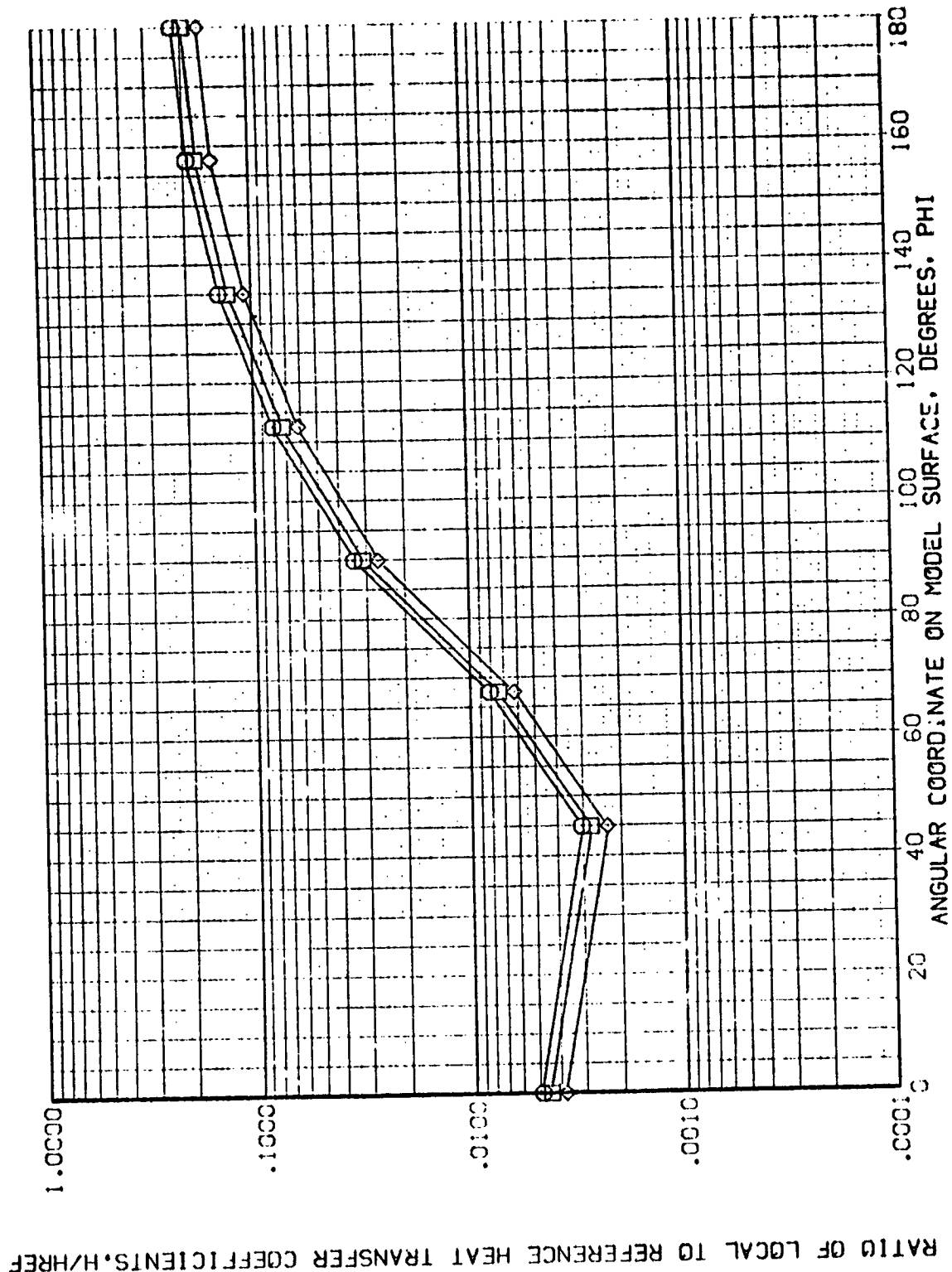


FIG. 4 TANK, ALONE

AMES 3.5-:95 1428 T1 EXTERNAL TANK

(REV-16)

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
RN/L 1.000

SYNTH. HREF/H REF DEFICIENTS, H/HREF  
X/L .450 VACH 5.220  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER DEFICIENTS, H/HREF

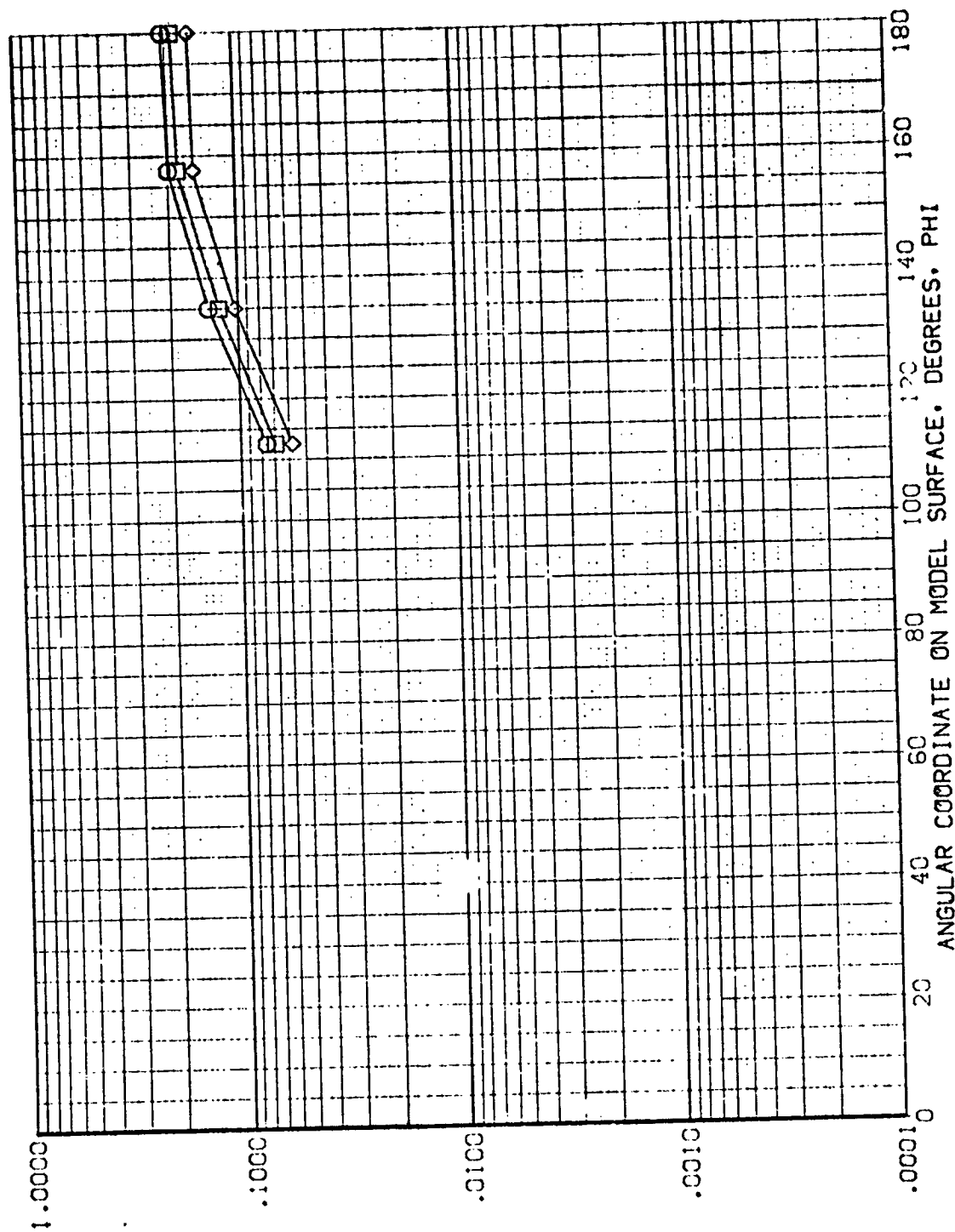


FIG. 4 TANK, ALONE

(REV116)

EXTERNAL TANK

AYES 3.5-195 IH28 T1

PARAMETRIC VALUES  
-90.00° BETA .000  
PV/L 1.000

ALPHA  
PV/L

SYNCH H4/HT X/L YACH  
.850 .500 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

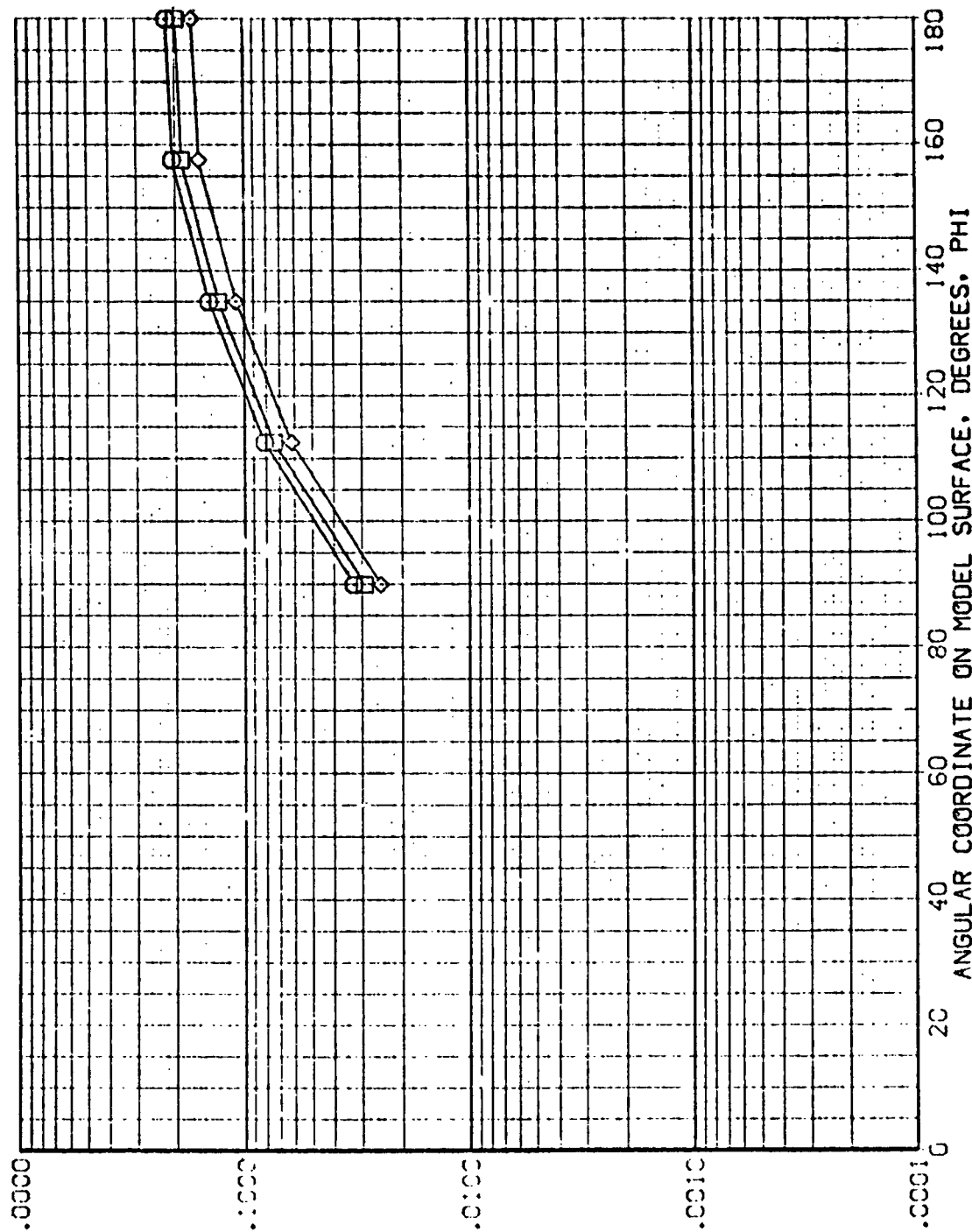


FIG. 4 TANK ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK (REVT16)

SYMBOL	WAVELENGTH	X/L	MACH	ALPHA	PARAMETRIC VALUES
◇	.550	.550	5.220	RN/L	-90.000 BETA
◇	.900				1.000
◇	1.000				.000

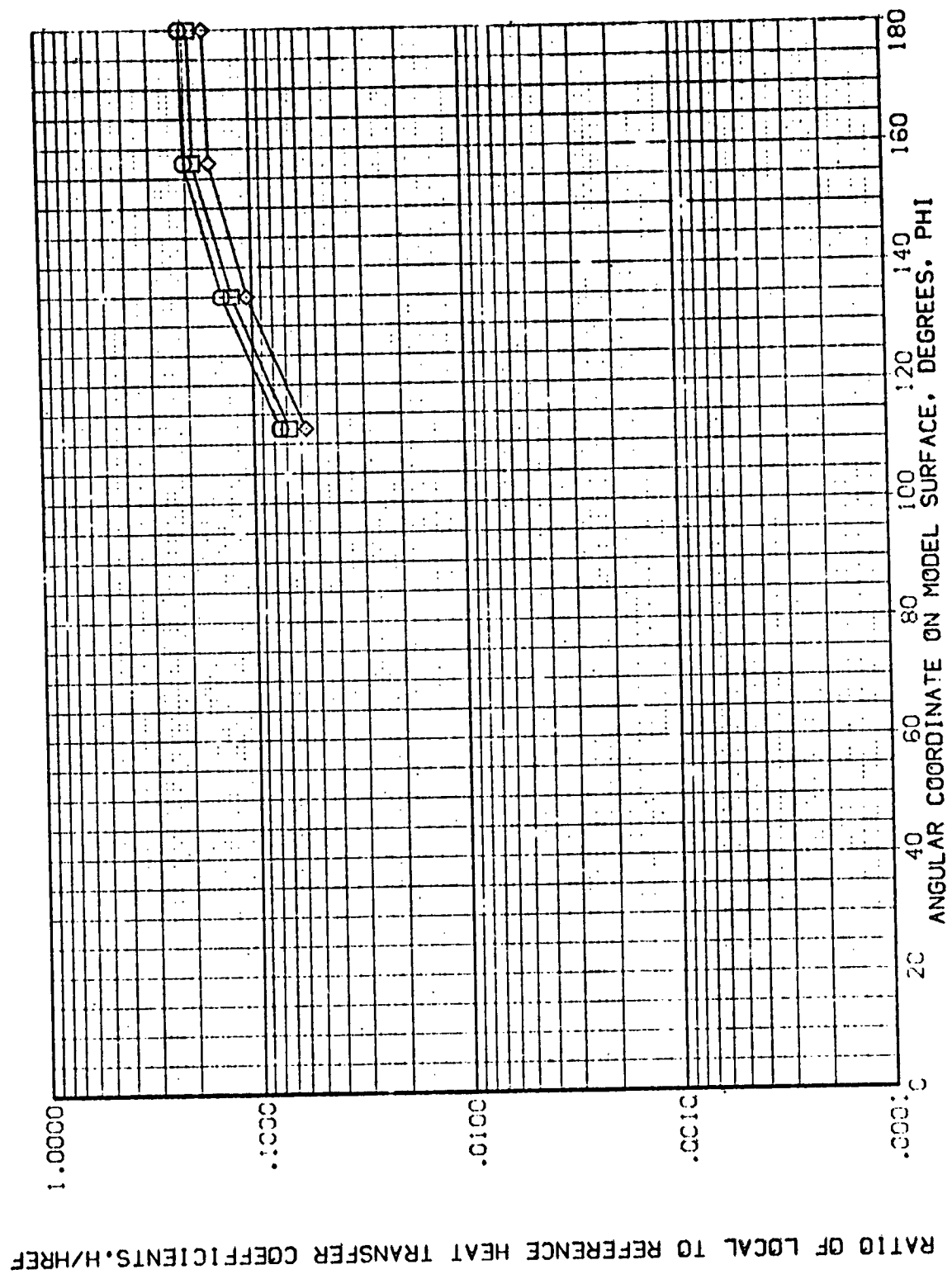


FIG. 4 TANK ALONE

AMES 3.5-195 IH28 T1

EXTERNAL TANK

(REV116)

SYMBOL

HEIGHT  
.850  
.930  
1.000

X/L  
.500

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RV/L

BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

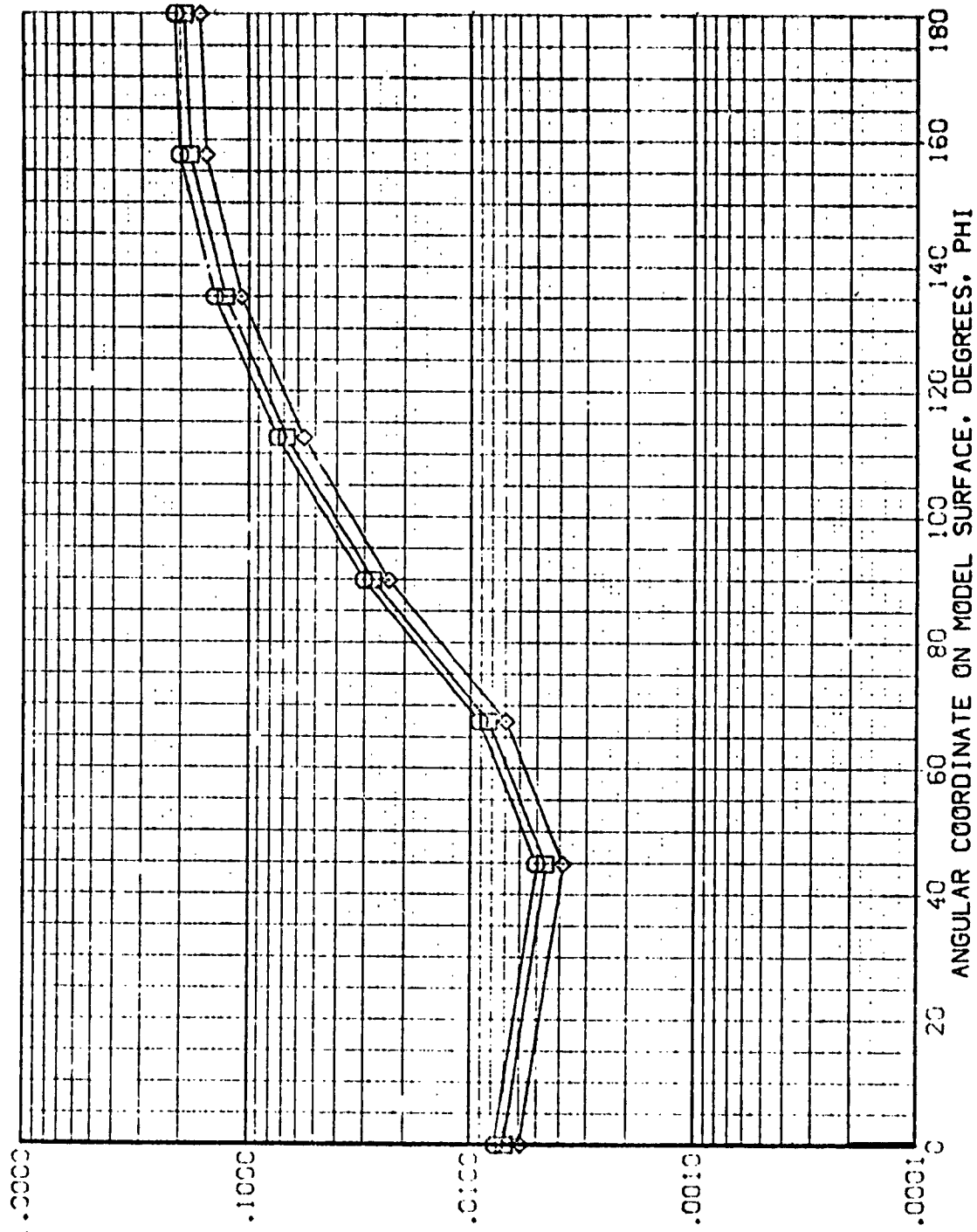


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV16)

SYMBOL HAW/HT X/L MACH  
 ○ 1.000  
 ○ .900  
 ○ .850

PARAMETRIC VALUES  
 ALPHA -90.000  
 BETA 1.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

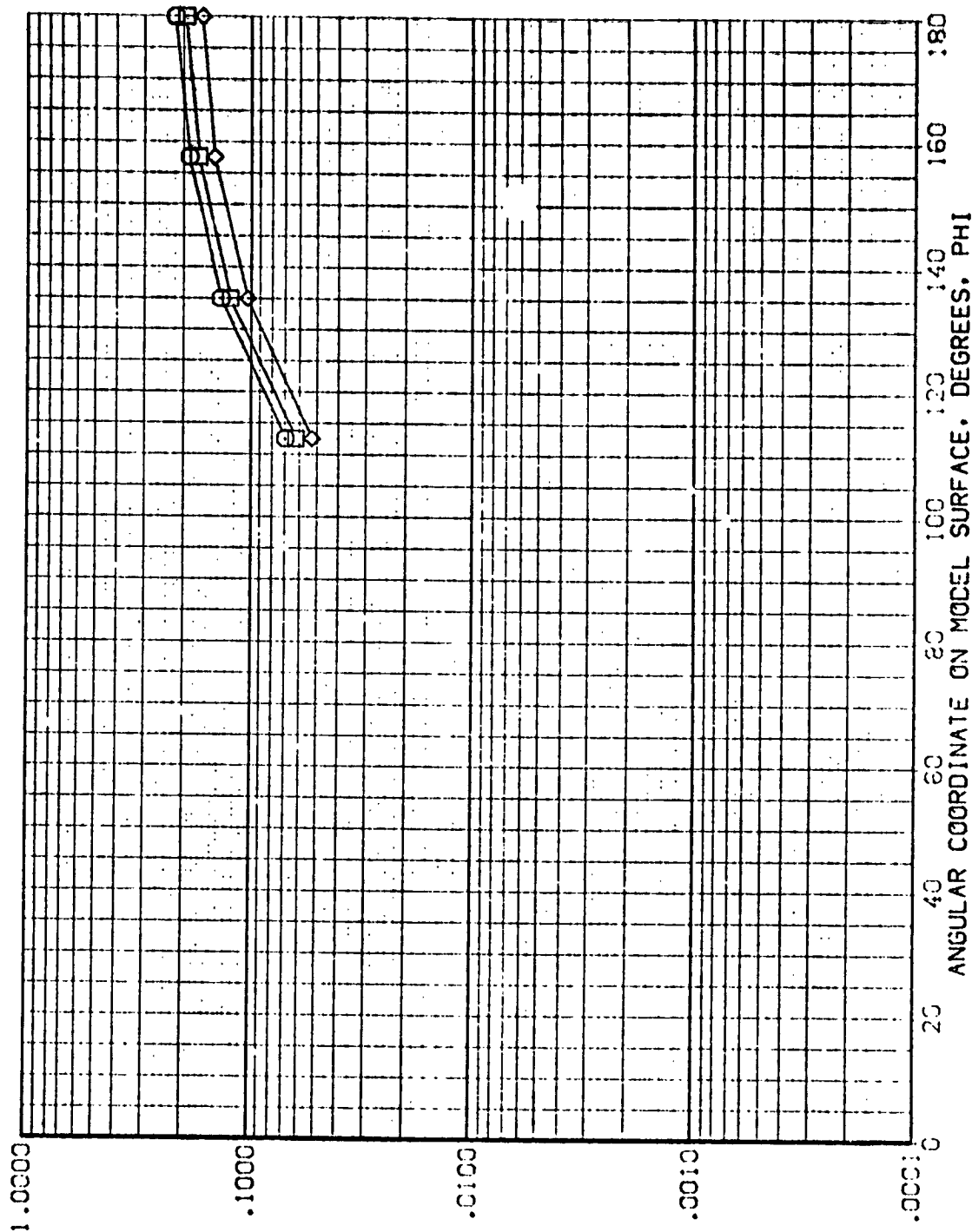


FIG. 4 TANK ALONE

(REV T16)

EXTERNAL TANK

AMES 3.5-:95 IH28 T1

SYMBOL

WALL/HT

X/L

MACH

.850

.700

5.220

PATAMETRIC VALUES

-9.000

BETA

30

PA/L

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

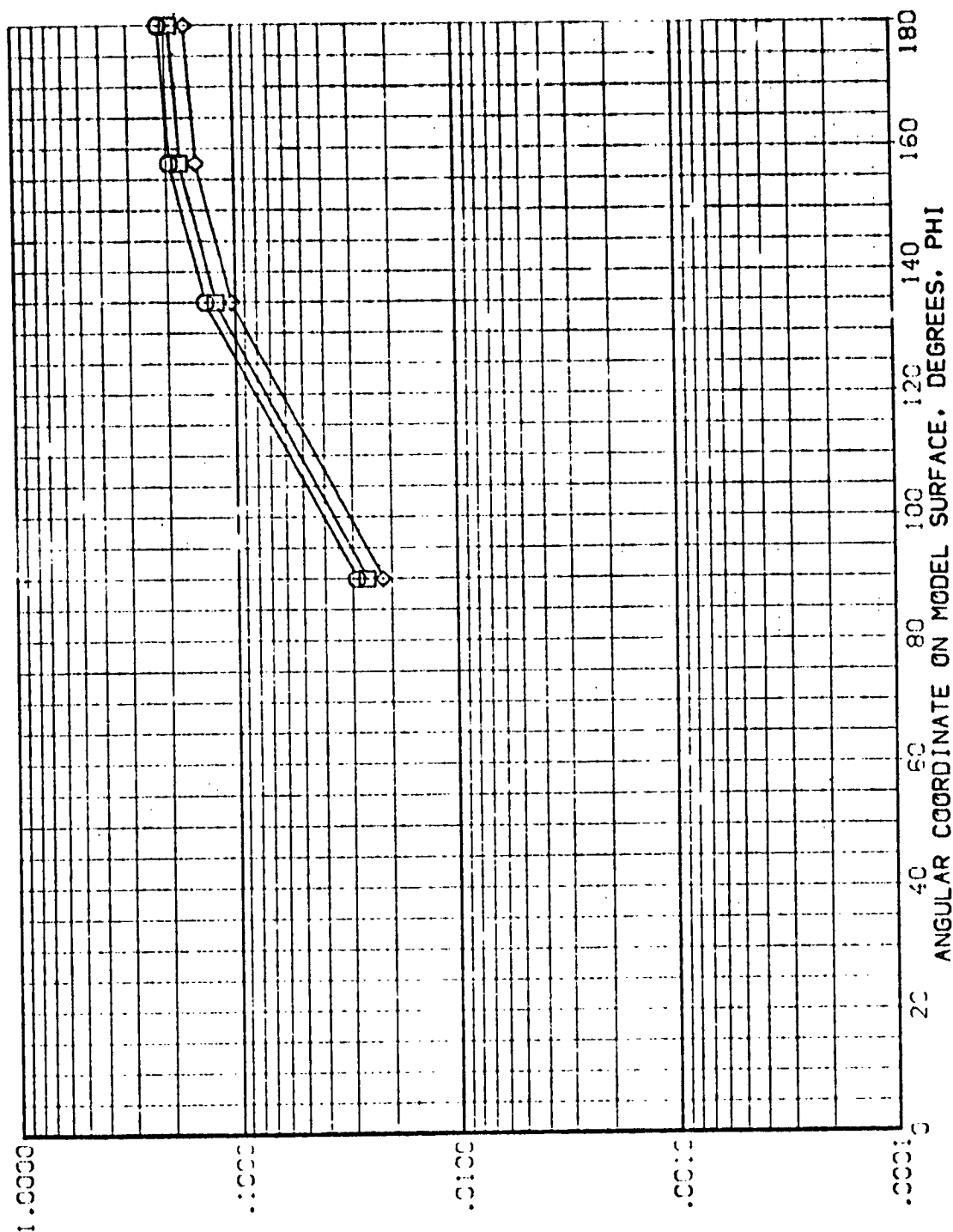


FIG. 4 TANK, ALONE

# AMES 3.5-195 1428 T1 EXTERNAL TANK

(REV116)

SYMBOL H/W/L X/L VACH  
 ◇ .850 .750 5.220  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

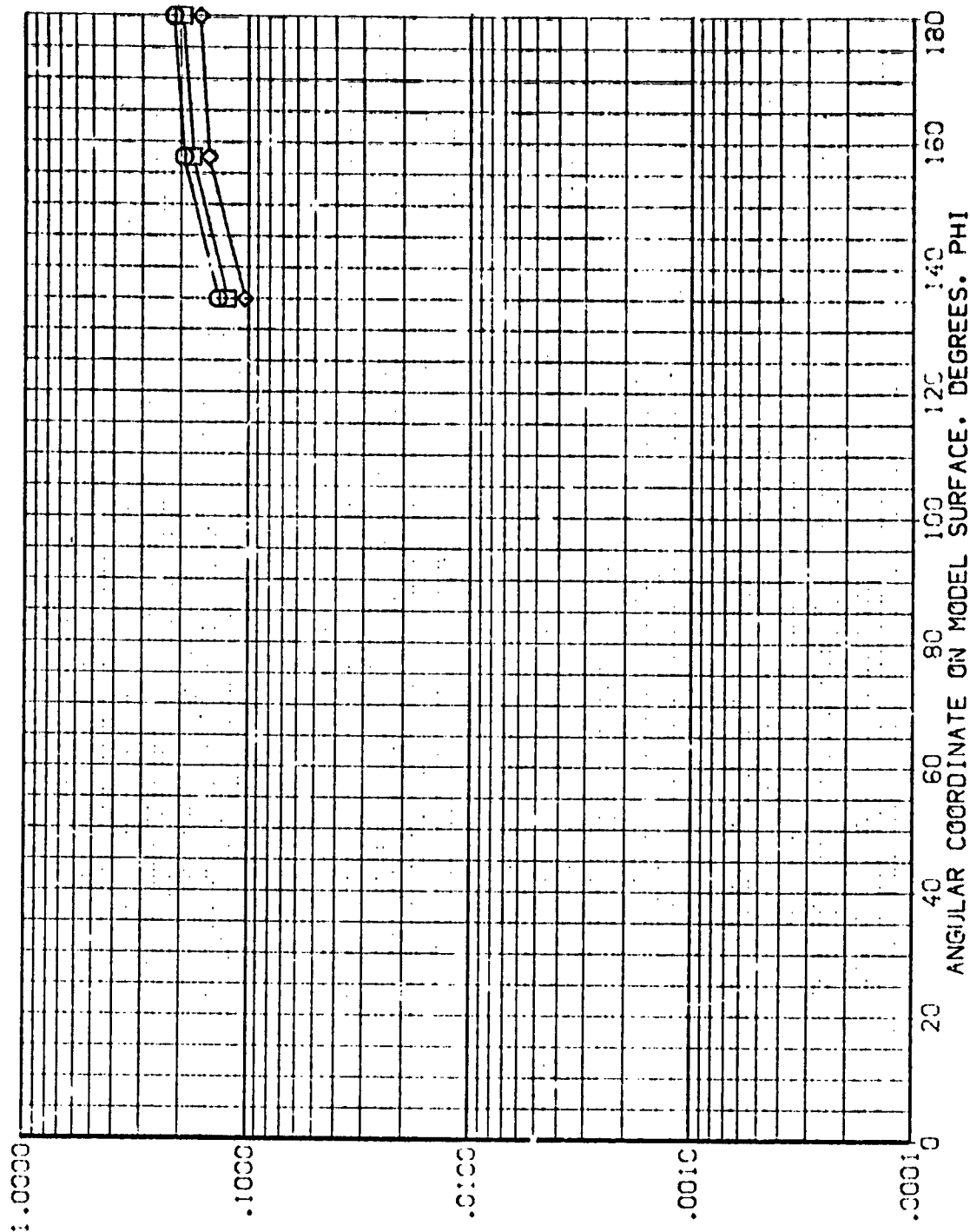


FIG. 4 TANK, ALONE



(CONT.)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYMBOL	HA/WHT	X/L	MACH	PARAMETRIC VALUES	
	.850	.800	5.220	ALPHA	BETA
	.900			R/L	
	1.000				1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

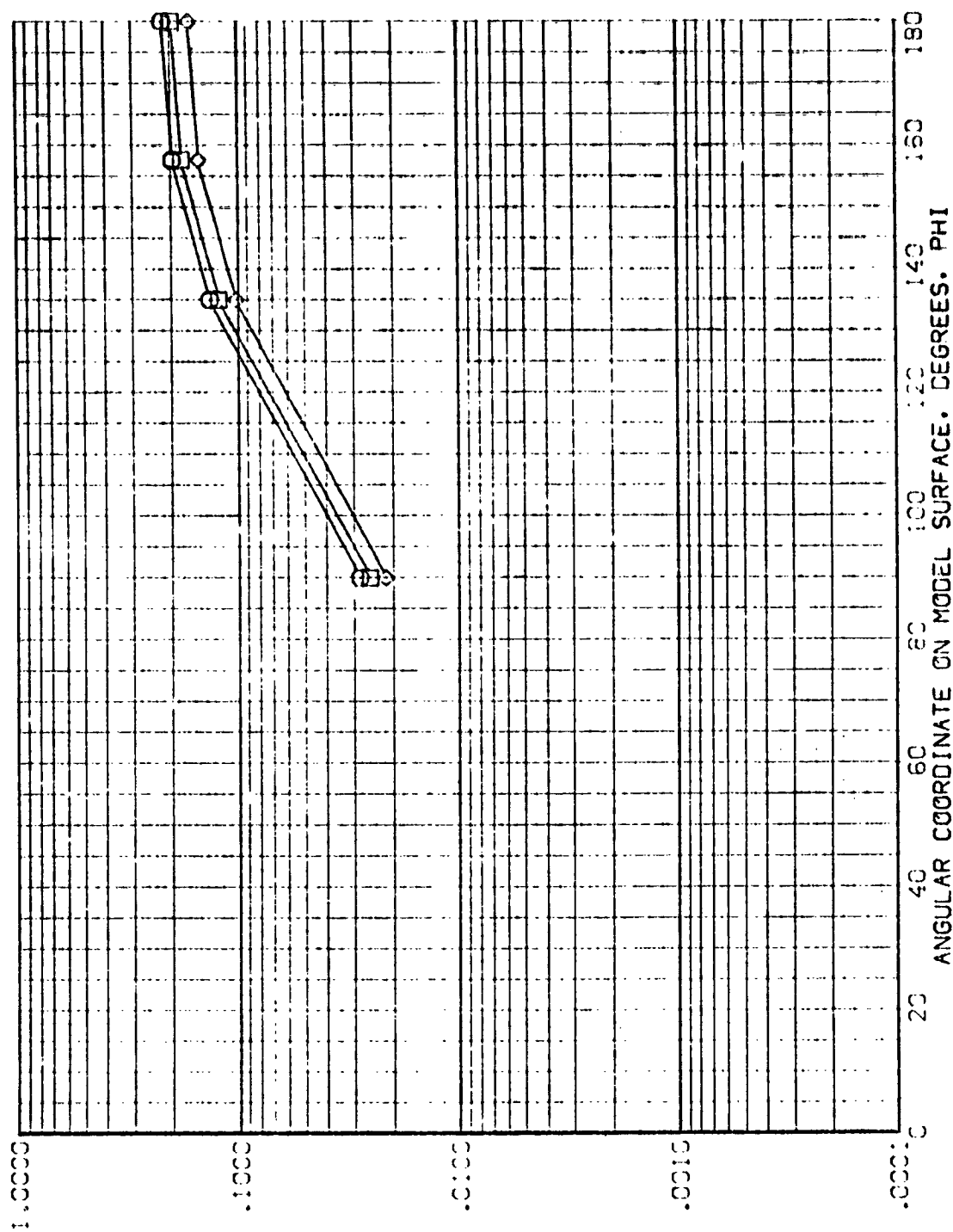


FIG. 4 TANK ALONE

# AVES 3.5-195 1428 T1 EXTERNAL TANK (REV116)

PARAMETRIC VALUES  
 ALPHA 1.000  
 BETA 1.000  
 GAMMA 1.000

VALUES  
 X 1.000  
 Y 1.000  
 Z 1.000  
 W 1.000  
 V 1.000  
 U 1.000  
 T 1.000  
 S 1.000  
 R 1.000  
 Q 1.000  
 P 1.000  
 O 1.000  
 N 1.000  
 M 1.000  
 L 1.000  
 K 1.000  
 J 1.000  
 I 1.000  
 H 1.000  
 G 1.000  
 F 1.000  
 E 1.000  
 D 1.000  
 C 1.000  
 B 1.000  
 A 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

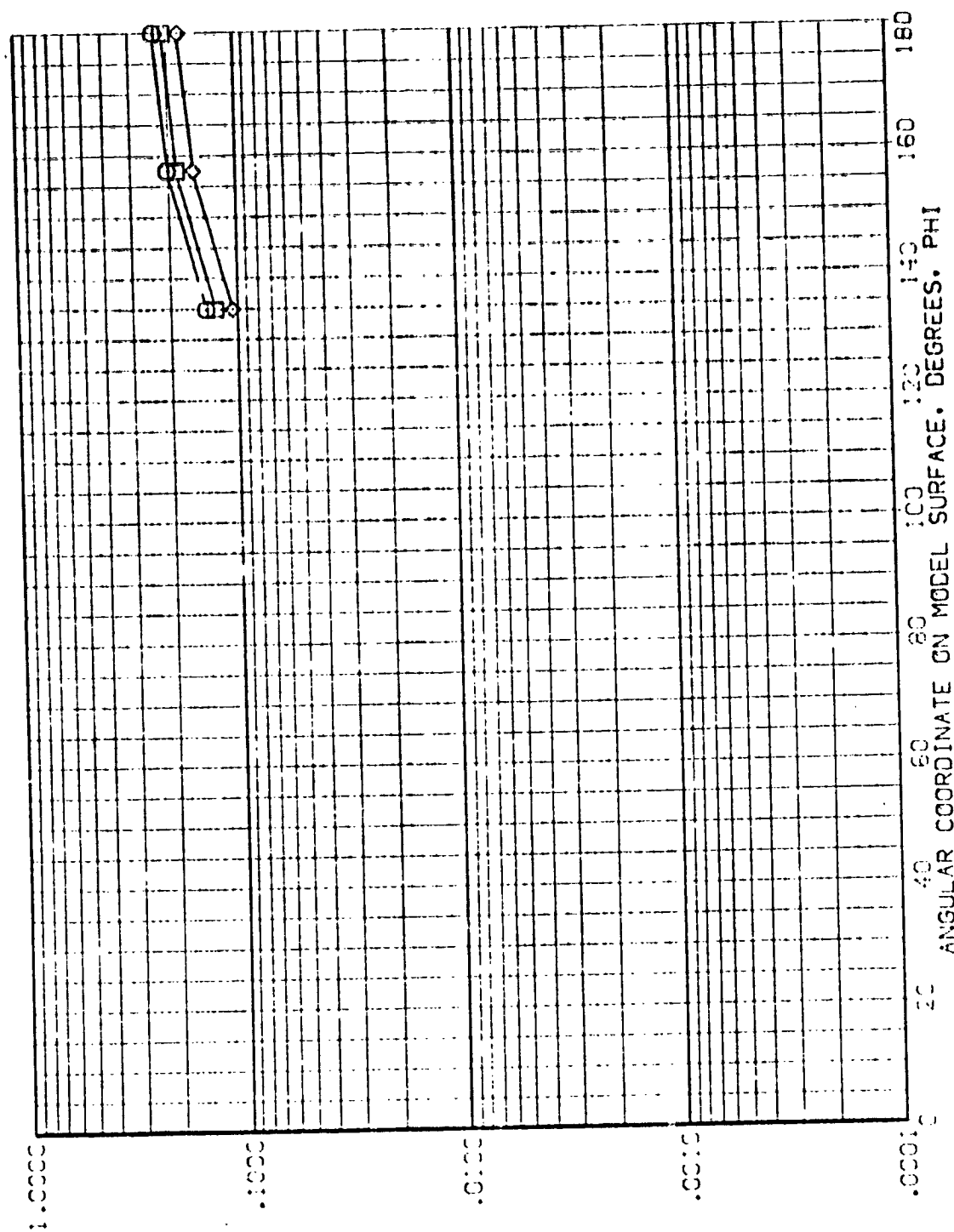


FIG. 4 TANK PLANE

(REV116)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
-90.0° BETA .000  
1.000

ALPHA  
RN/L

SYMBOL H/H<sub>REF</sub> X/L MACH  
◇ 1.0 .850 5.220  
○ .900  
△ .900  
▽ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

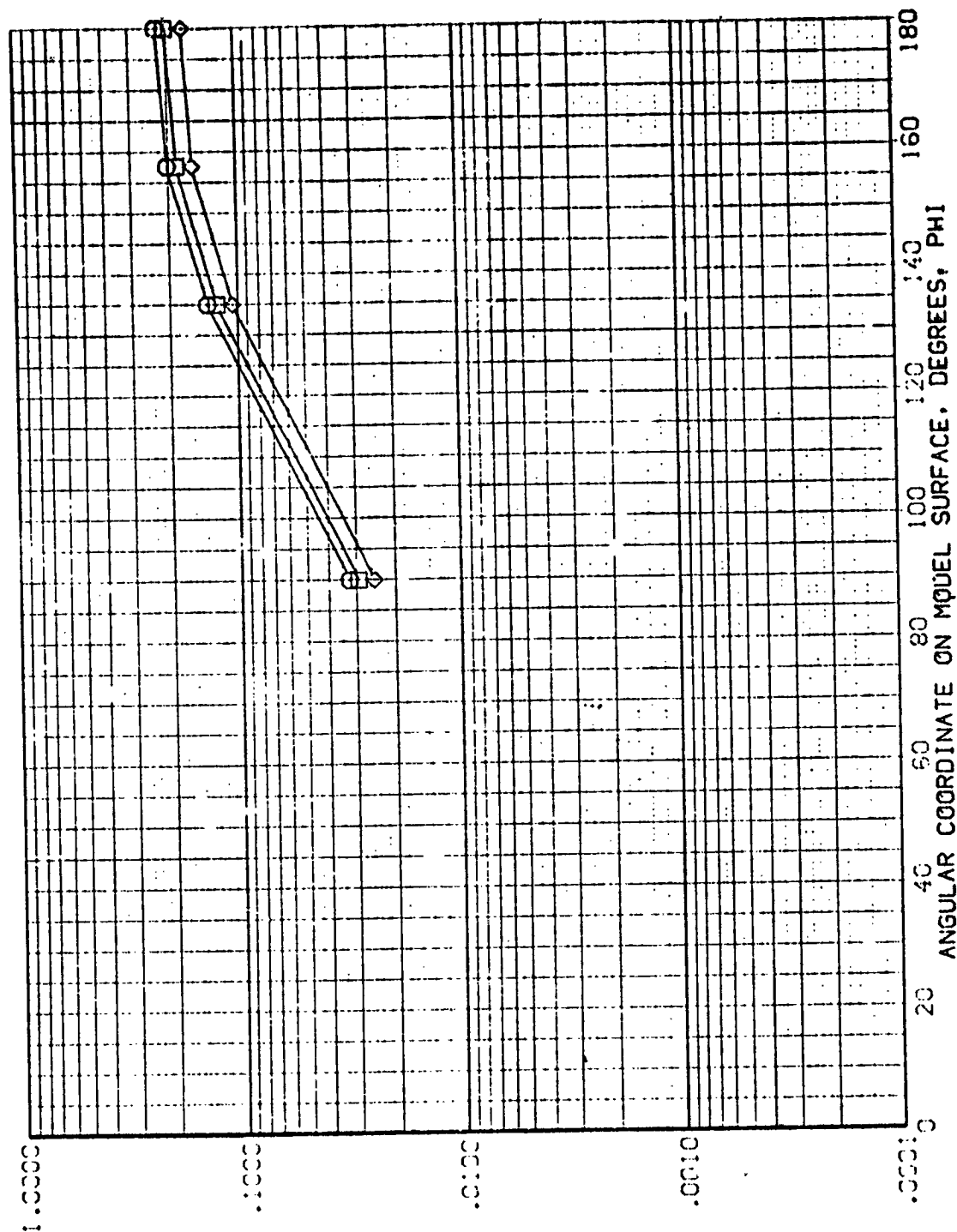


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1      EXTERNAL TANK      (REV117)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
				RN/L	
◇	.950	.350	5.220	-120.000	1.000
□	.900				
	1.000				

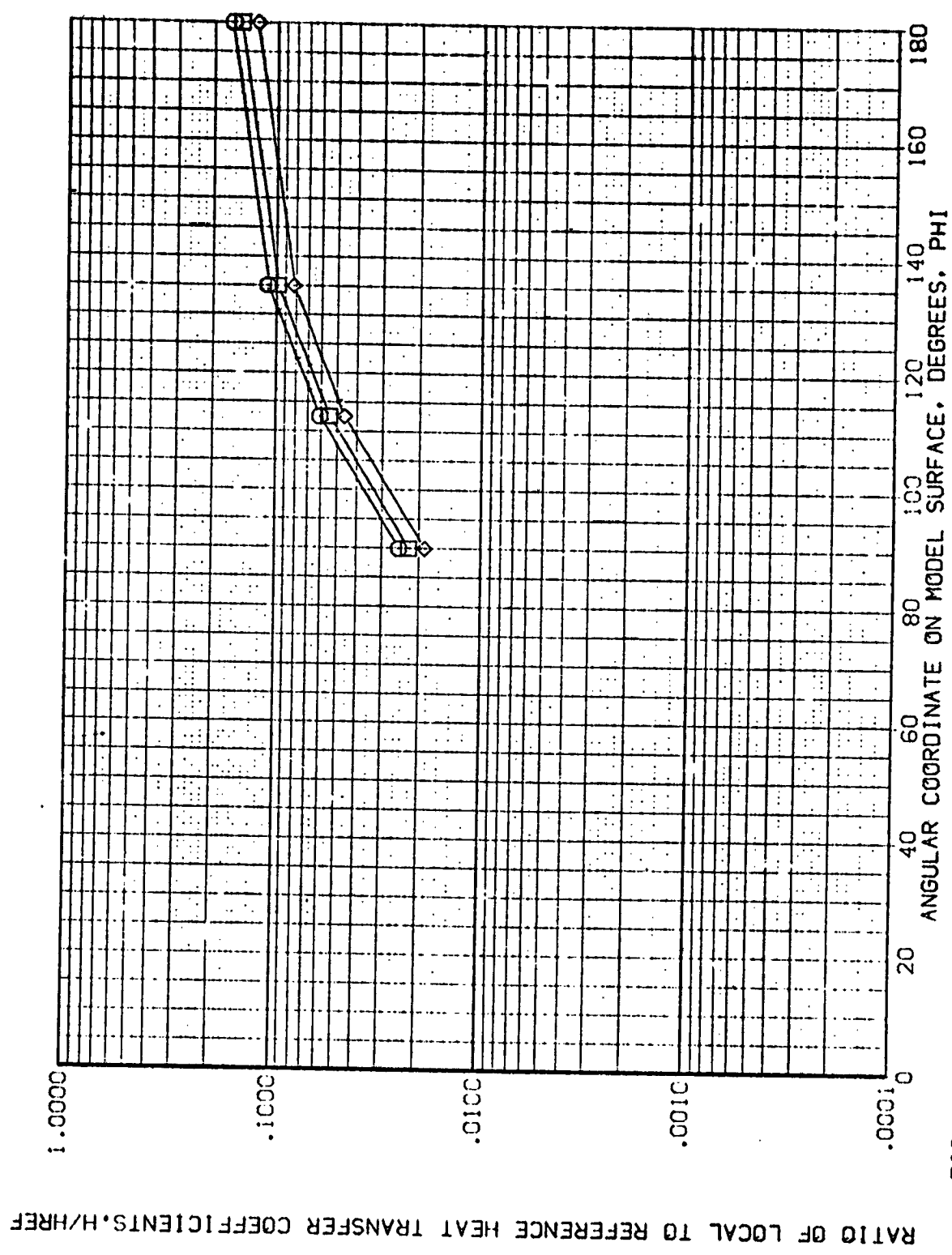


FIG. 4 TANK, ALONE

(REV17)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

◆ 170

SPEED  
WAVE/UT  
.853  
.900  
1.000

X/L  
.400  
5.220

PARAMETRIC VALUES  
ALPHA  
PHI/L  
-120.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

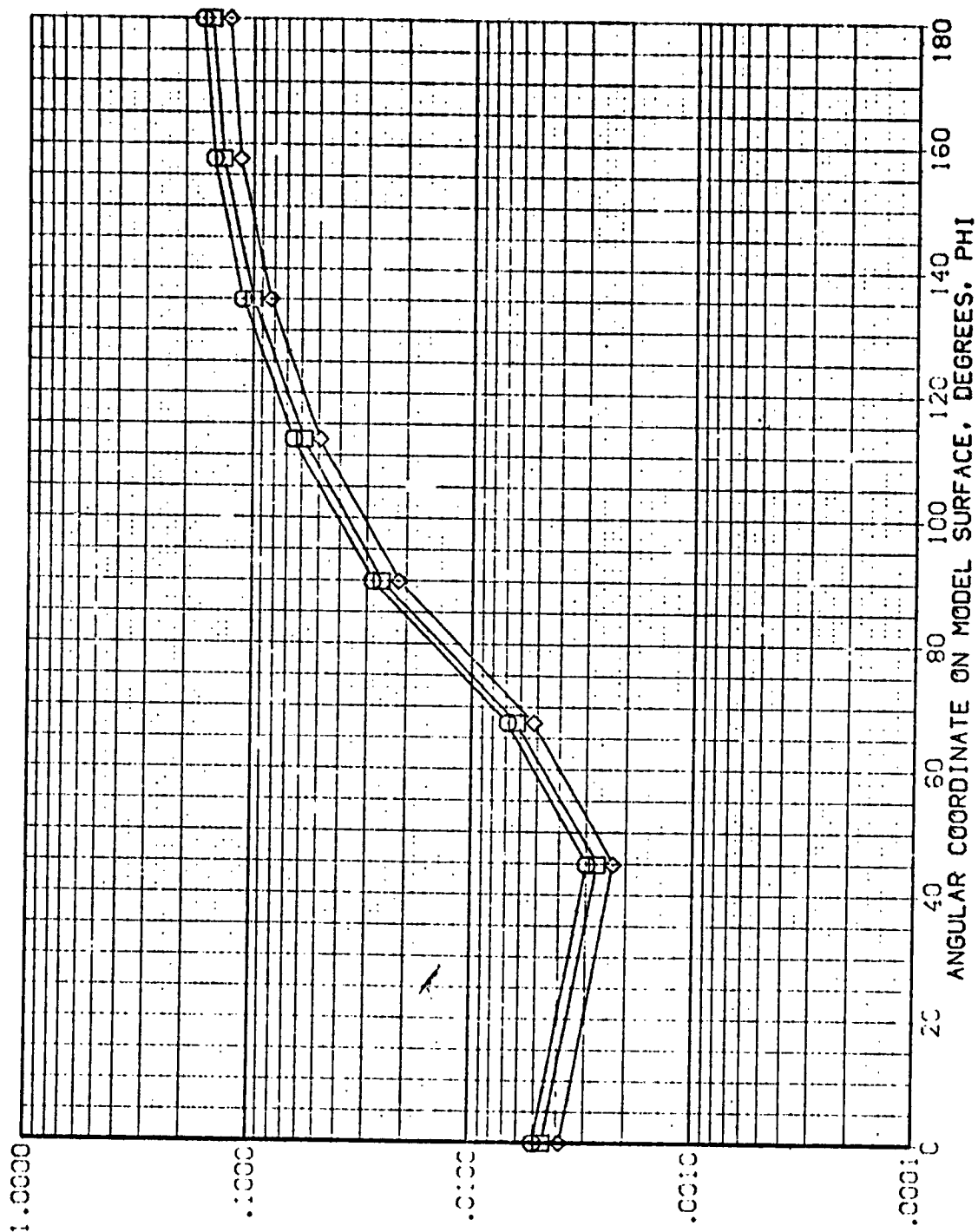


FIG. 4 TANK, ALONE

ANES 3.5-195 IH28 T1      EXTERNAL TANK      (REV117)  
 SYMBO      L-W/H      X/L      YACH      PARAMETRIC VALUES  
                  .850      .450      5.220      ALPHA      -120.000      BETA      .000  
                  .900                     RN/L      1.000  
                  1.000

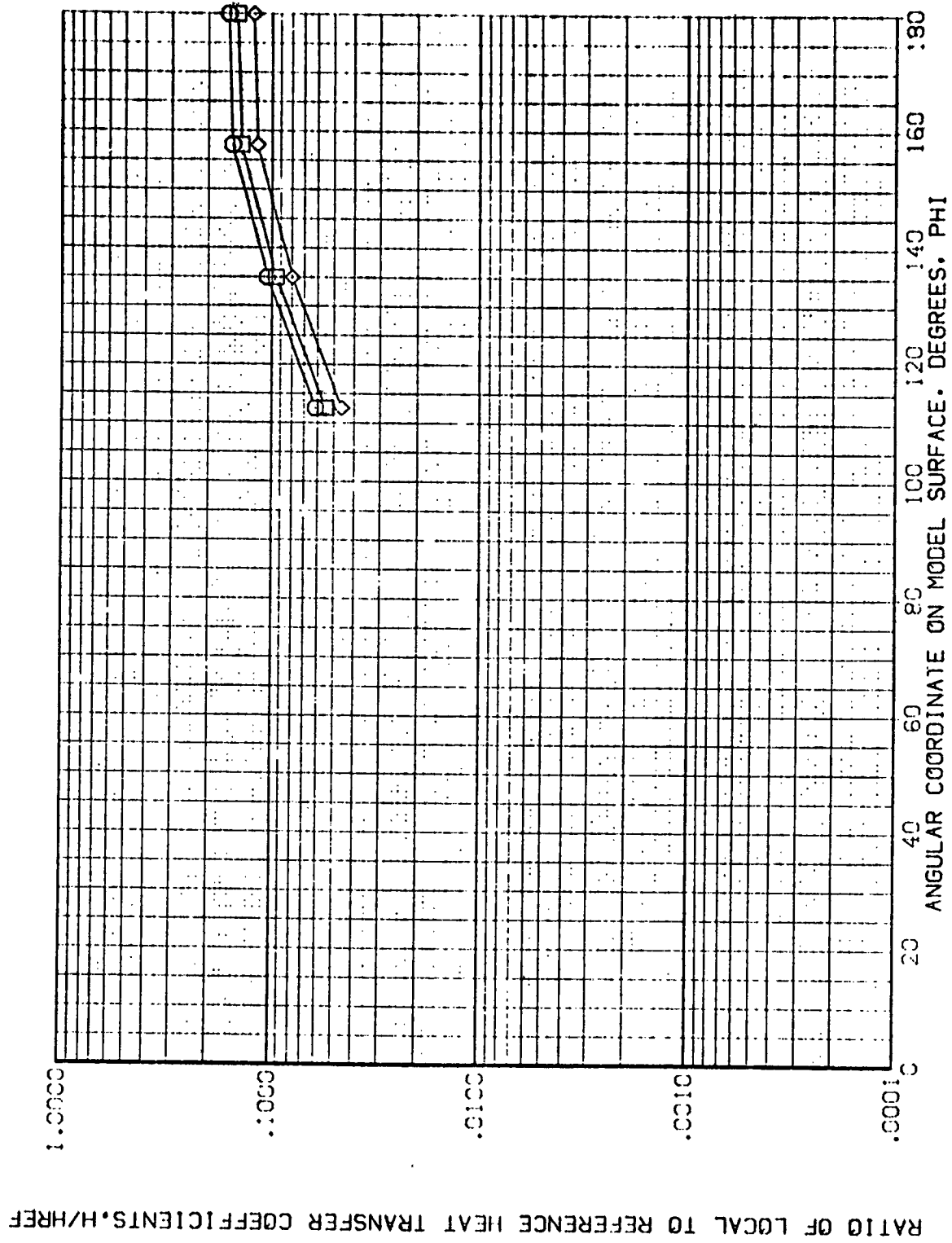


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV117)

SYMBOL H/W/H T X/L MACH  
 ○ .950  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 6E-7  
 RN/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

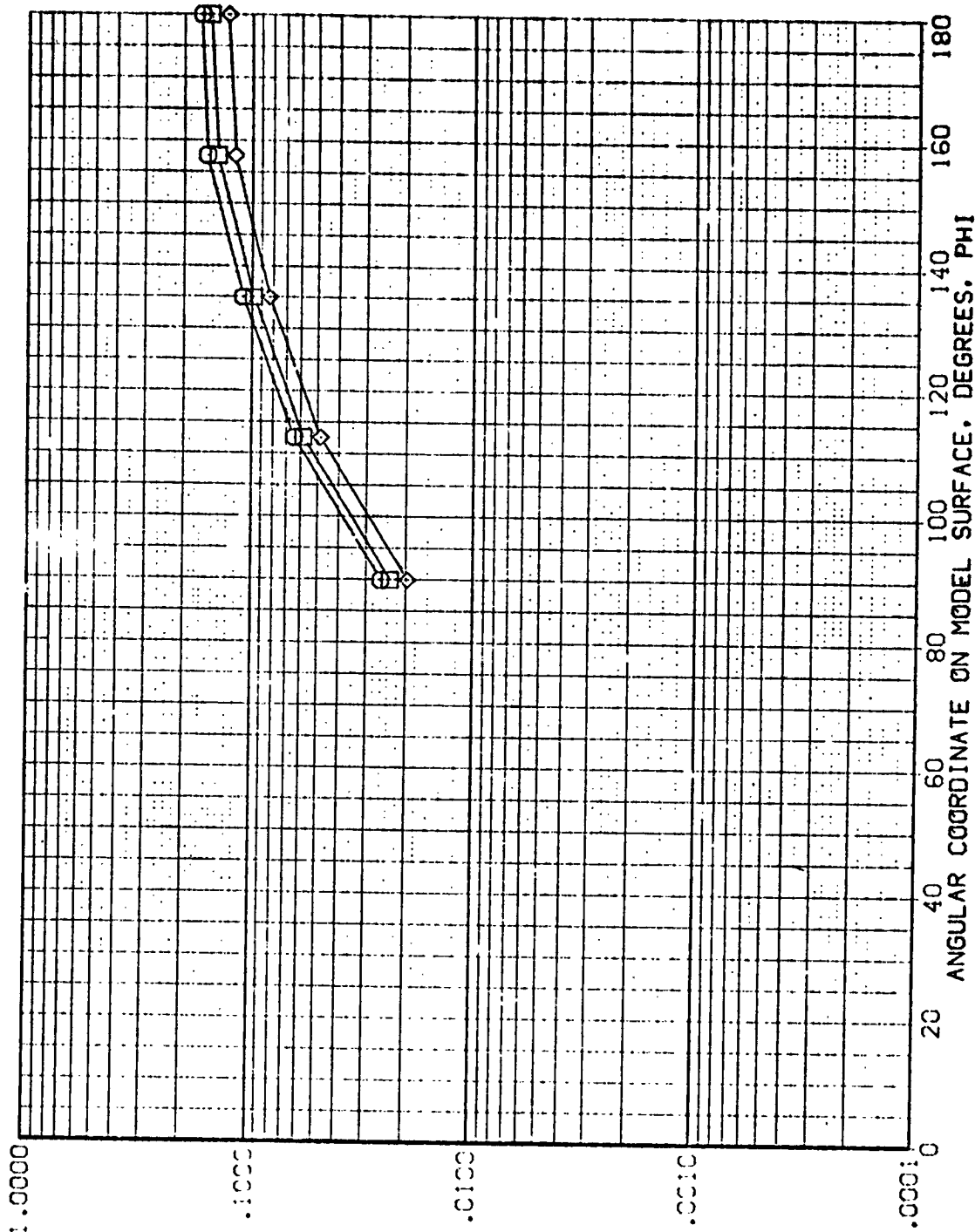


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV17)

SYMBOL MACH X/L MACH  
 .85C .553 5.220  
 .92C  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

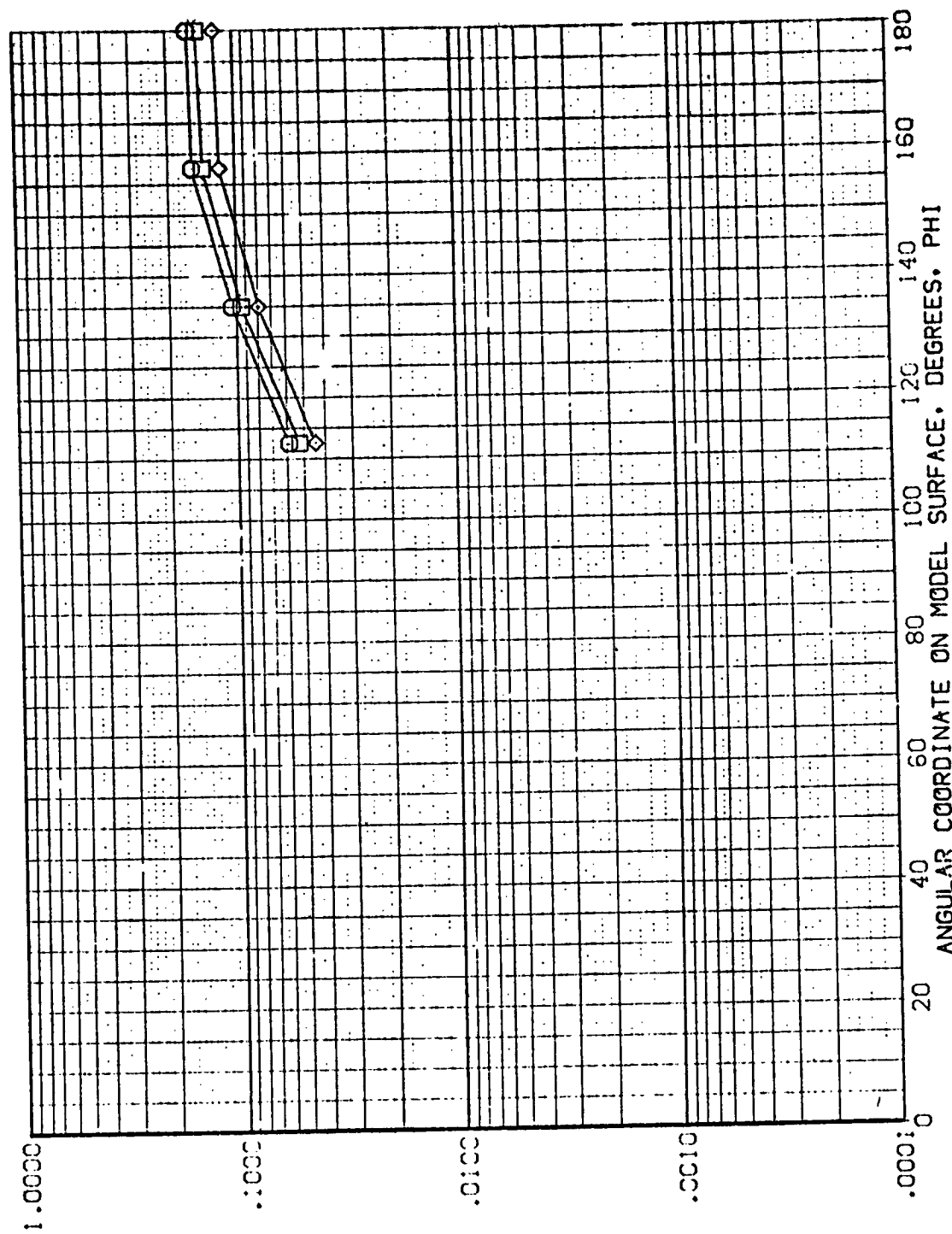


FIG. 4 TANK, ALONE



# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV17)

SYMBOL  $\square$   $\diamond$

MAW/HT .85C  
X/L .600  
MACH 5.220

PARAMETRIC VALUES  
ALPHA -120.000  
RN/L 1.000  
BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

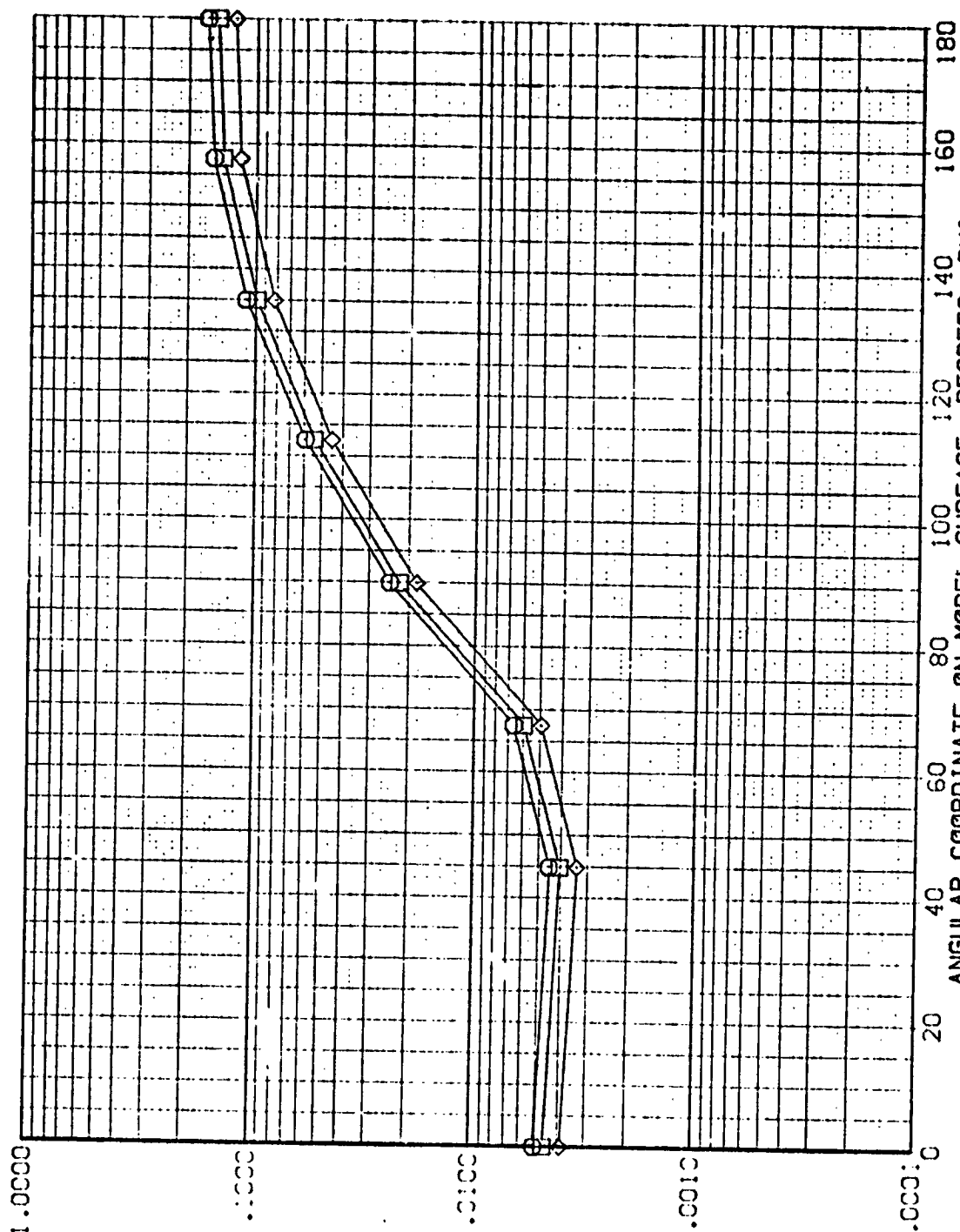


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV117)

SYNCL

WAV/HT  
.850  
.900  
1.000

X/L  
.550

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RN/L

-120.000  
1.000

BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

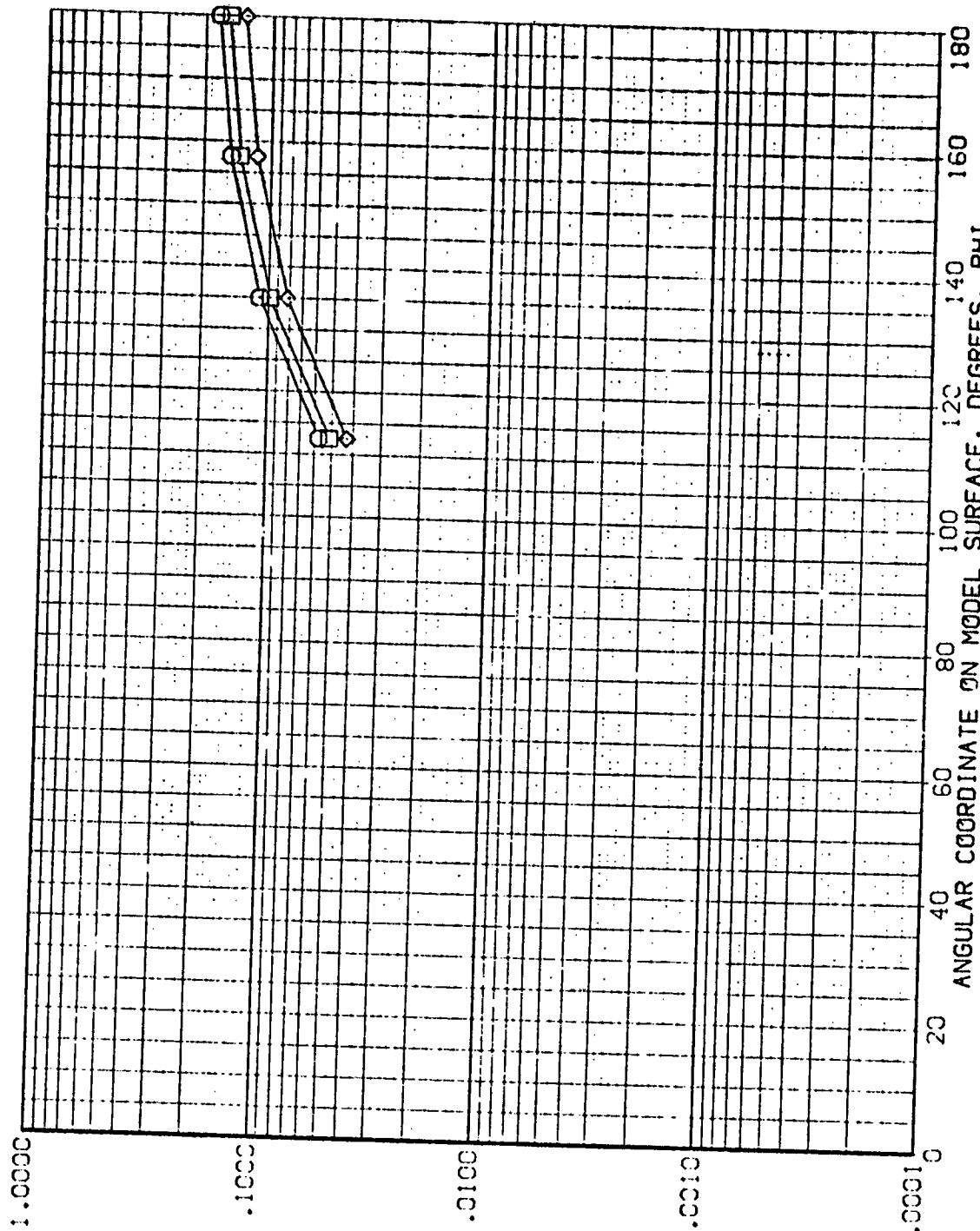


FIG. 4 TANK, ALONE

(REV117)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RN/L 1.000

SYMBOL HAN/HT X/L MACH  
◇ .850 .700 5.220  
□ .900  
◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

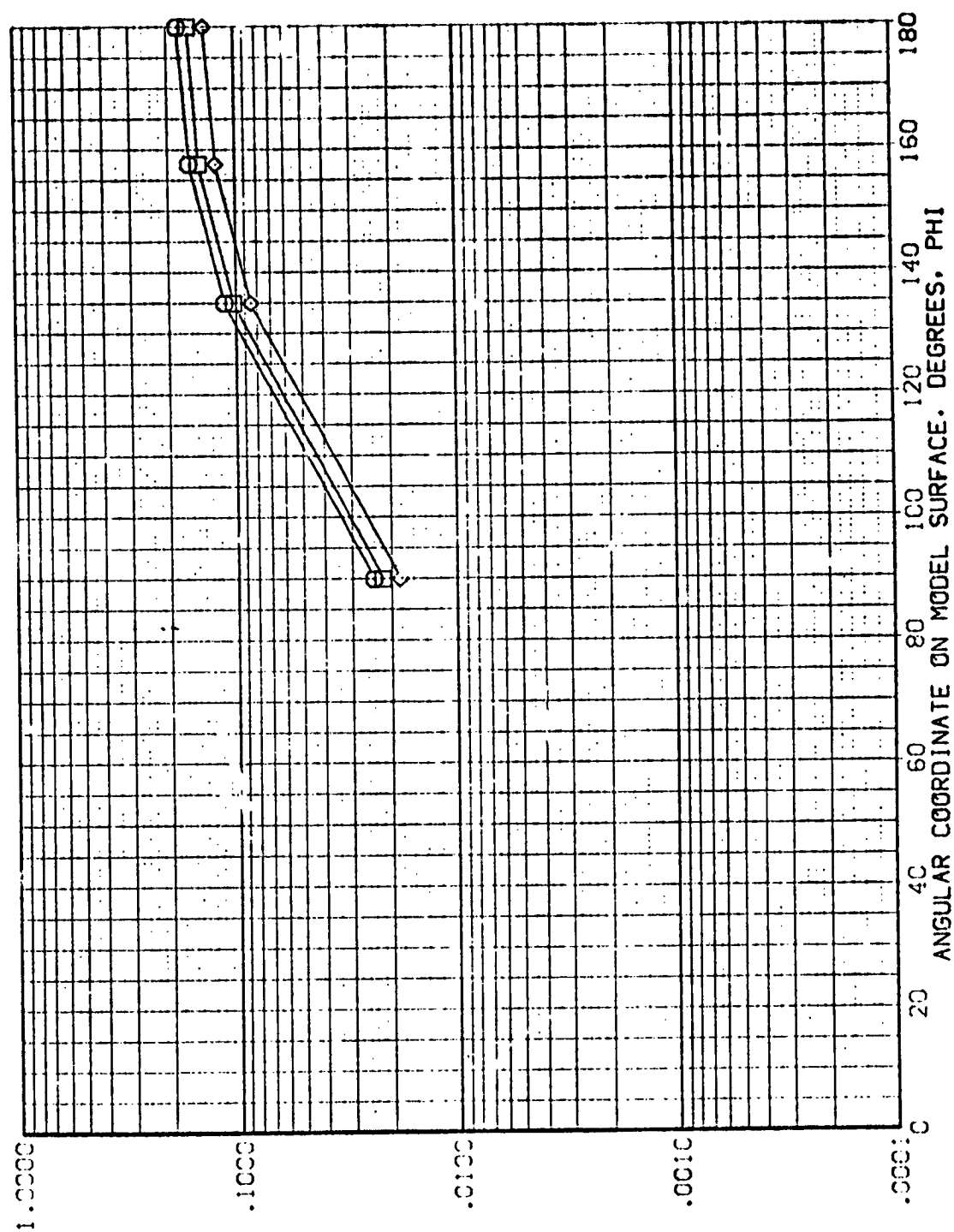


FIG. 4 TANK ALONE

# AXES 3.5-195 IH28 T1 EXTERNAL TANK

(REV117)

SYMBOL H/W/HT X/L MACH  
 ◇ .850 .750 5.220  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA  
 R1/L 1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

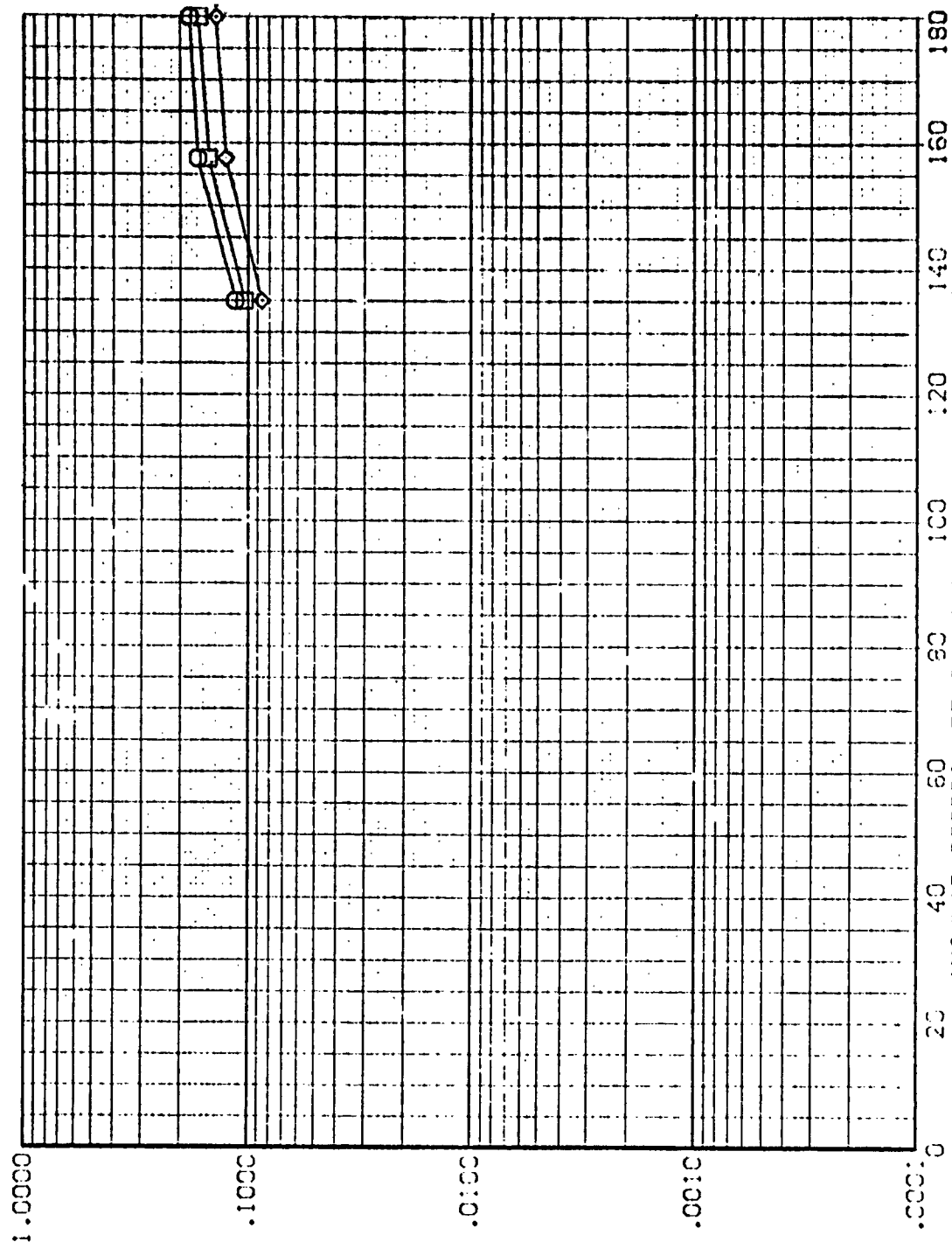


FIG. 4 TANK, ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV117)

SYMBOL

HA/WAT

X/L

MACH

◇ 1.000

◇ .950

◇ .800

◇ 5.220

PARAMETRIC VALUES

ALPHA  
PM/L

-120.000  
1.000

BETA

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

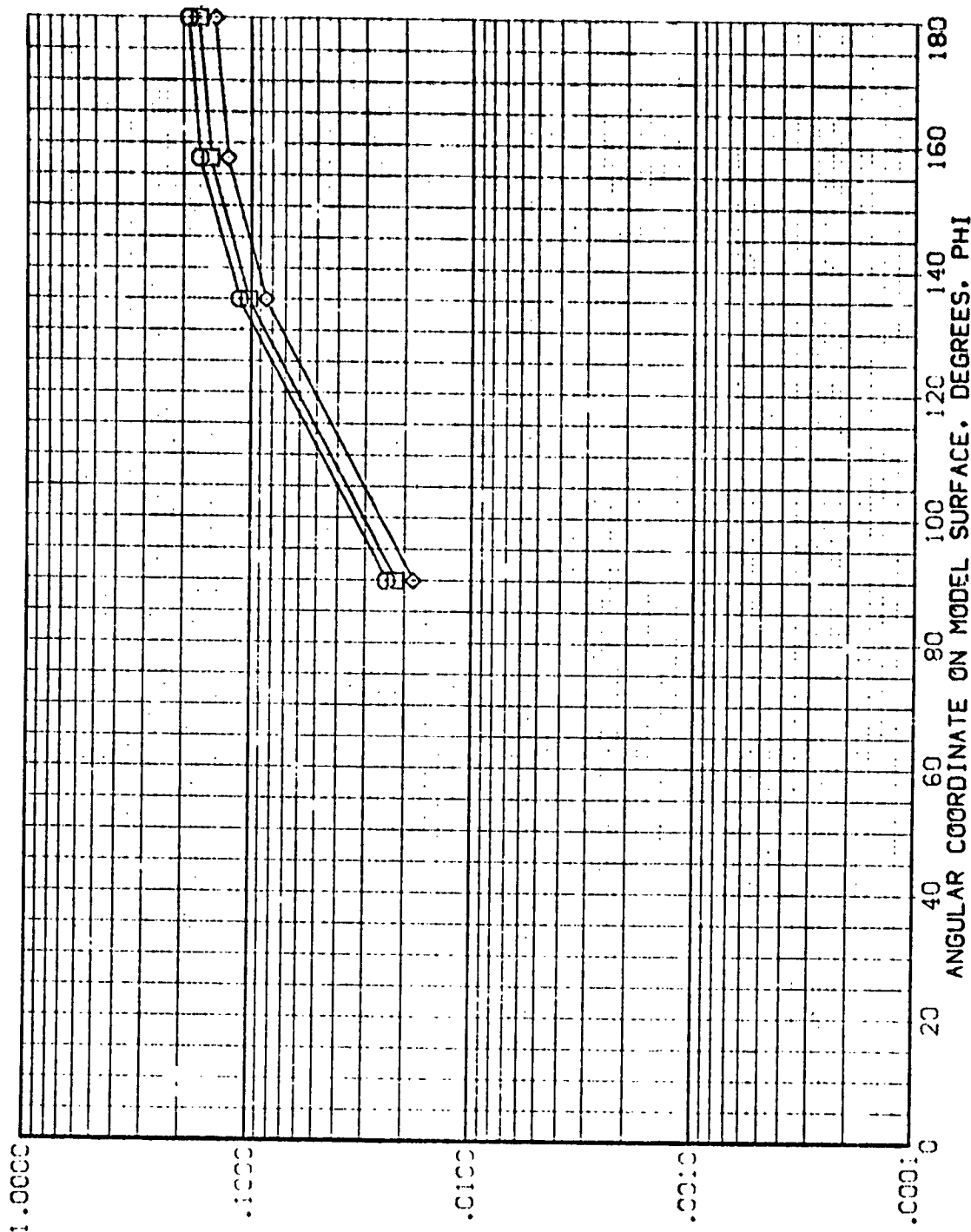


FIG. 4 TANK, ALONE

# AYES 3.5-195 1428 T1 EXTERNAL TANK (REVT17)

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RV/L 1.000

SYMBOL X/L MACH  
 .850 .850 5.220  
 .900 .900  
 1.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

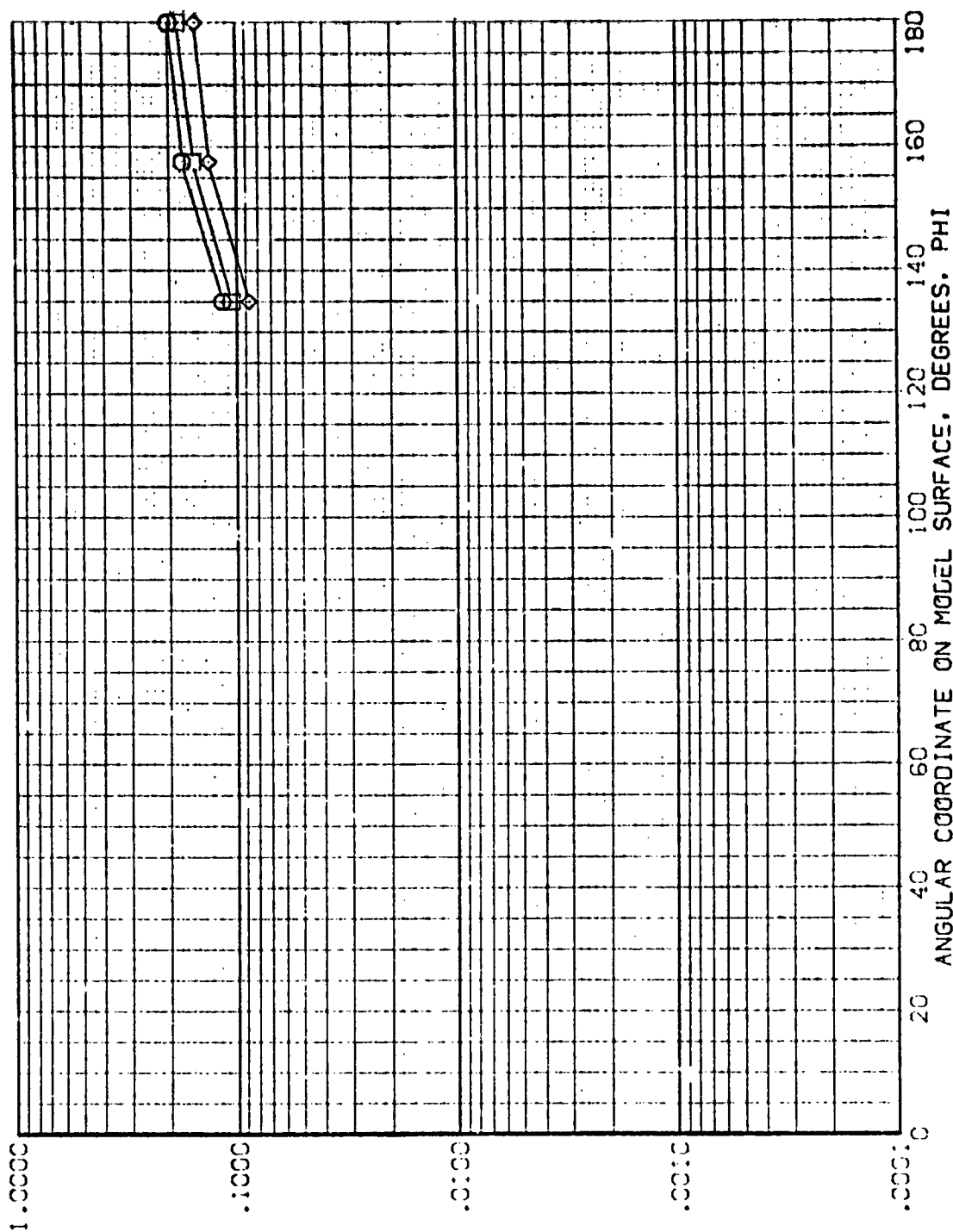


FIG. 4 TANK, ALONE

(REV 17)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RNU/L 1.000

SYMBOL HAW/HT X/L MACH  
◇ .850 .900 5.220  
◇ .900  
◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

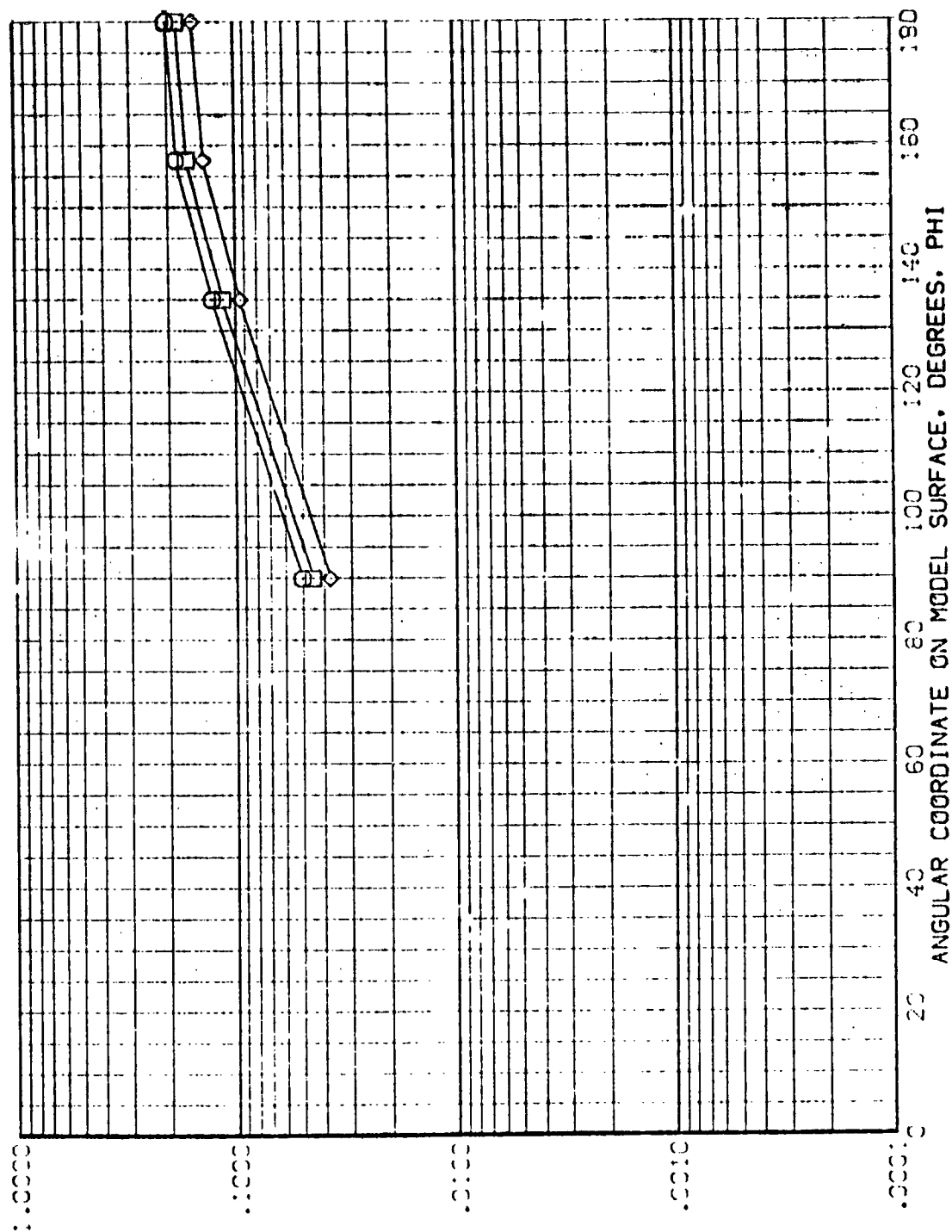
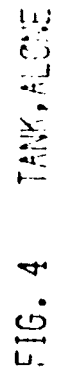


FIG. 4 TANK, ALONE

(81A38)

PARAMETRIC VALUES	
ALPHA	-93.00
BETA	4.000





AVES 3.5-195 1428 T1

EXTERNAL TANK

(REV118)

PARAMETRIC VALUES  
ALPHA -90.000 BETA .000  
P1/VL 1.000

SYMBOL MACH F/L MACH  
.850 .400 5.303  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

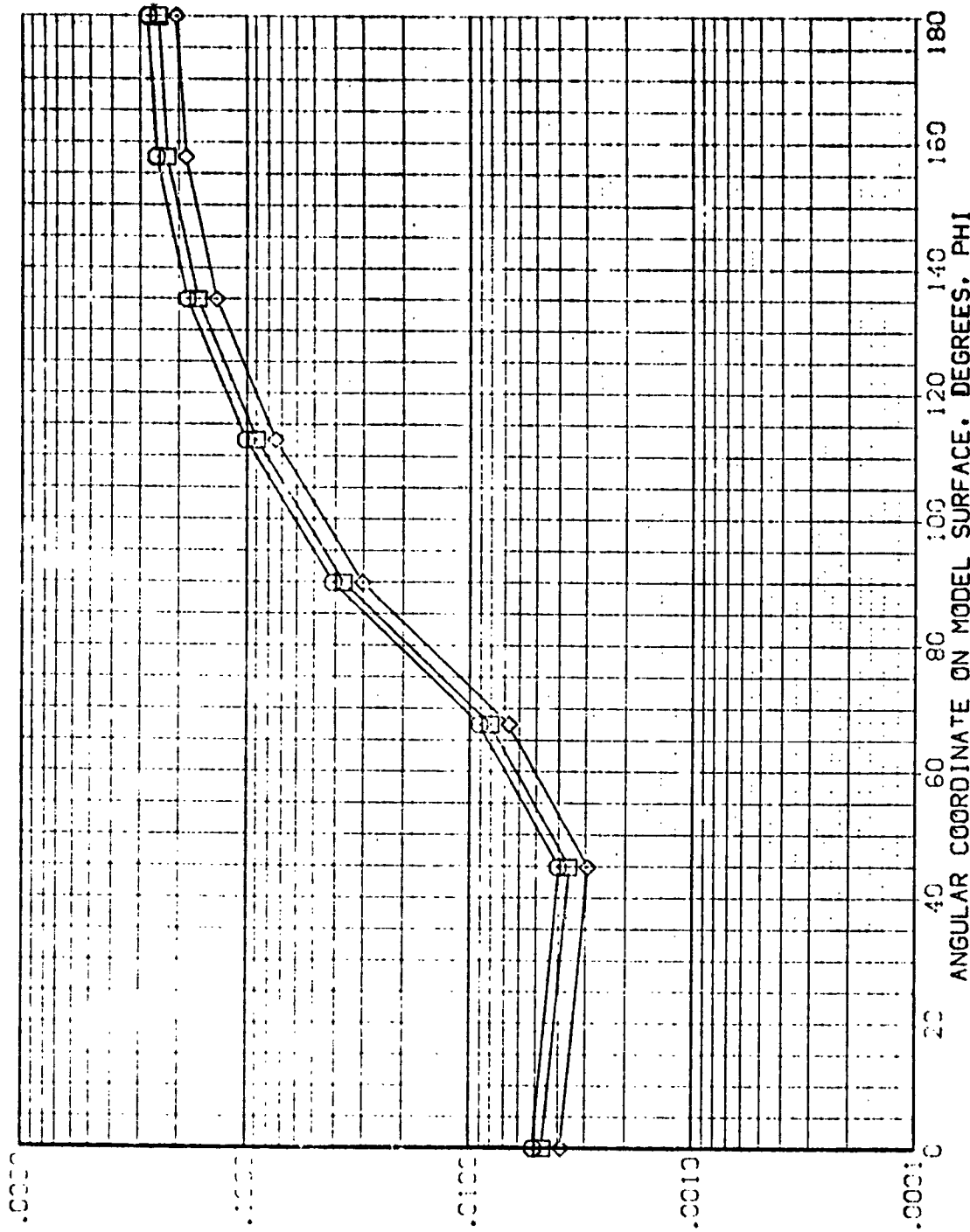


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1      EXTERNAL TANK      (REV18)

SYSC-	HAU/WT	X/L	MACH	PARAMETRIC VALUES
◇ □ ○	.650	.450	5.303	ALPHA      BETA
	.900			RN/L      4.000
	1.000			

.000

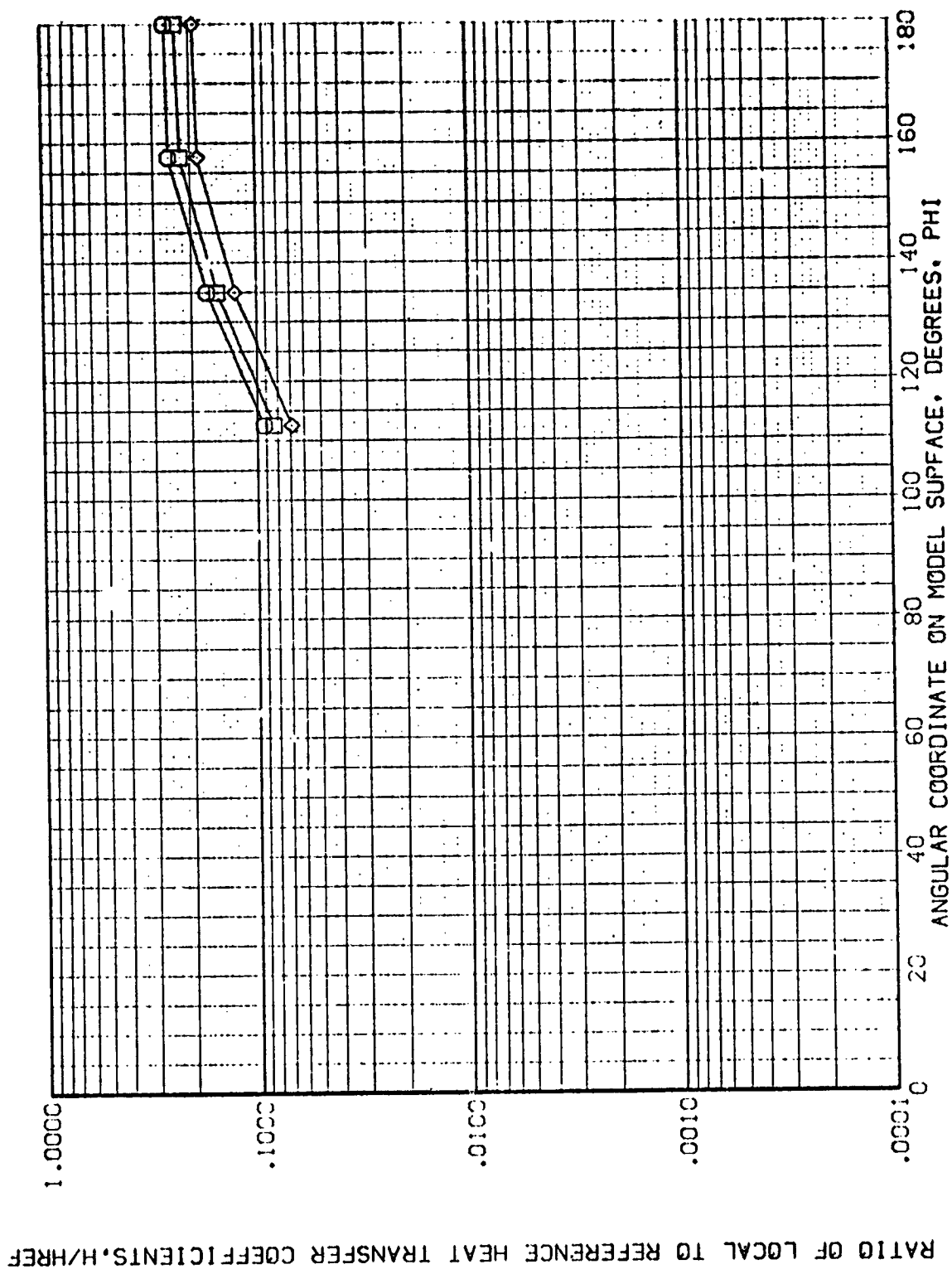


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV118)

SYMBOL	WAVE/WT	X/L	MACH	PARAMETRIC VALUES
◇	.853	.500	5.303	-90.000 ALPHA
□	.903			4.000 BETA
◇	1.000			

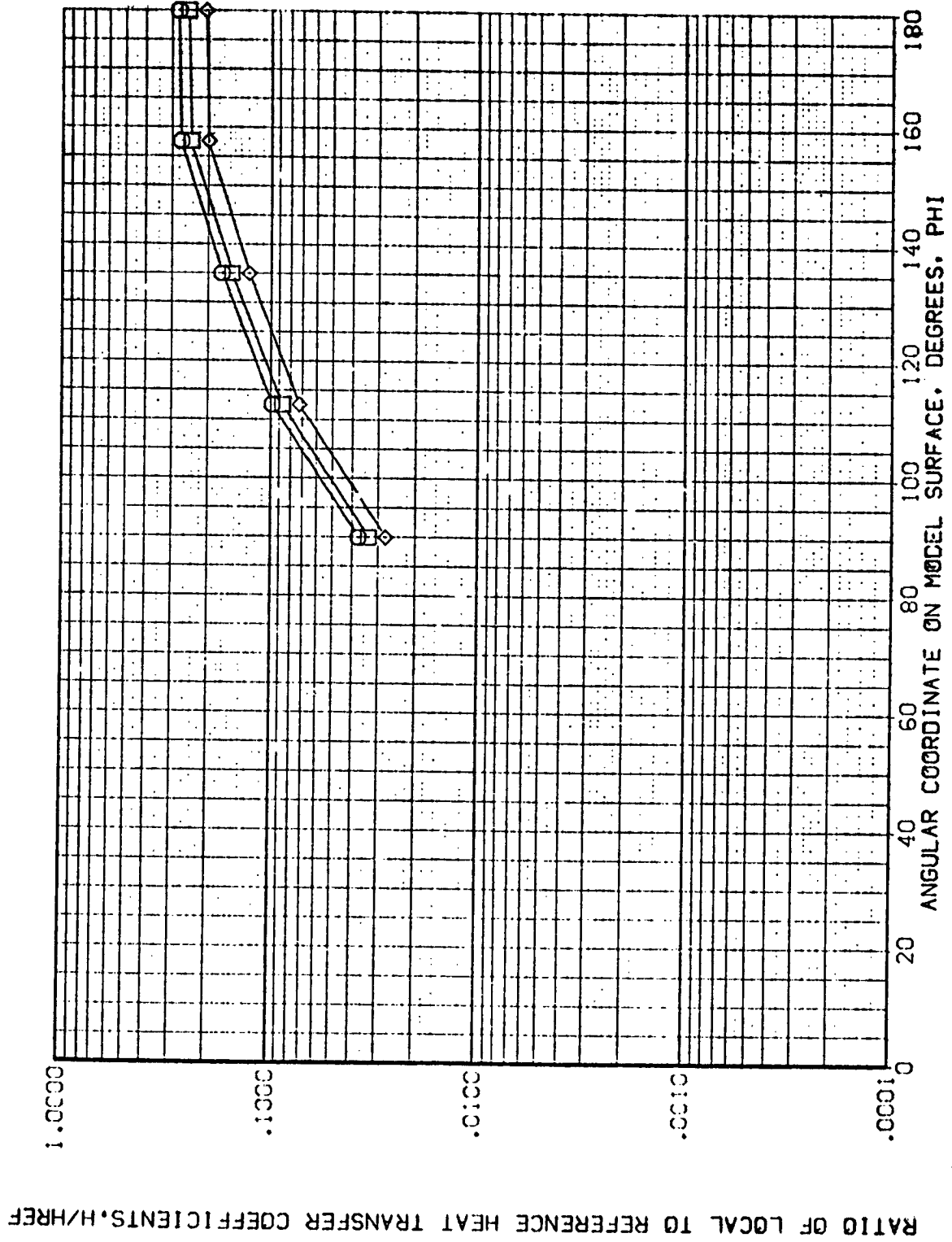


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV118)

SYMBOL H/W/LT X/L MACH  
 □ .850 .550 5.303  
 ◇ .900 .550 5.303  
 ◆ 1.000 .550 5.303

PARAMETRIC VALUES  
 -90.000 BETA  
 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

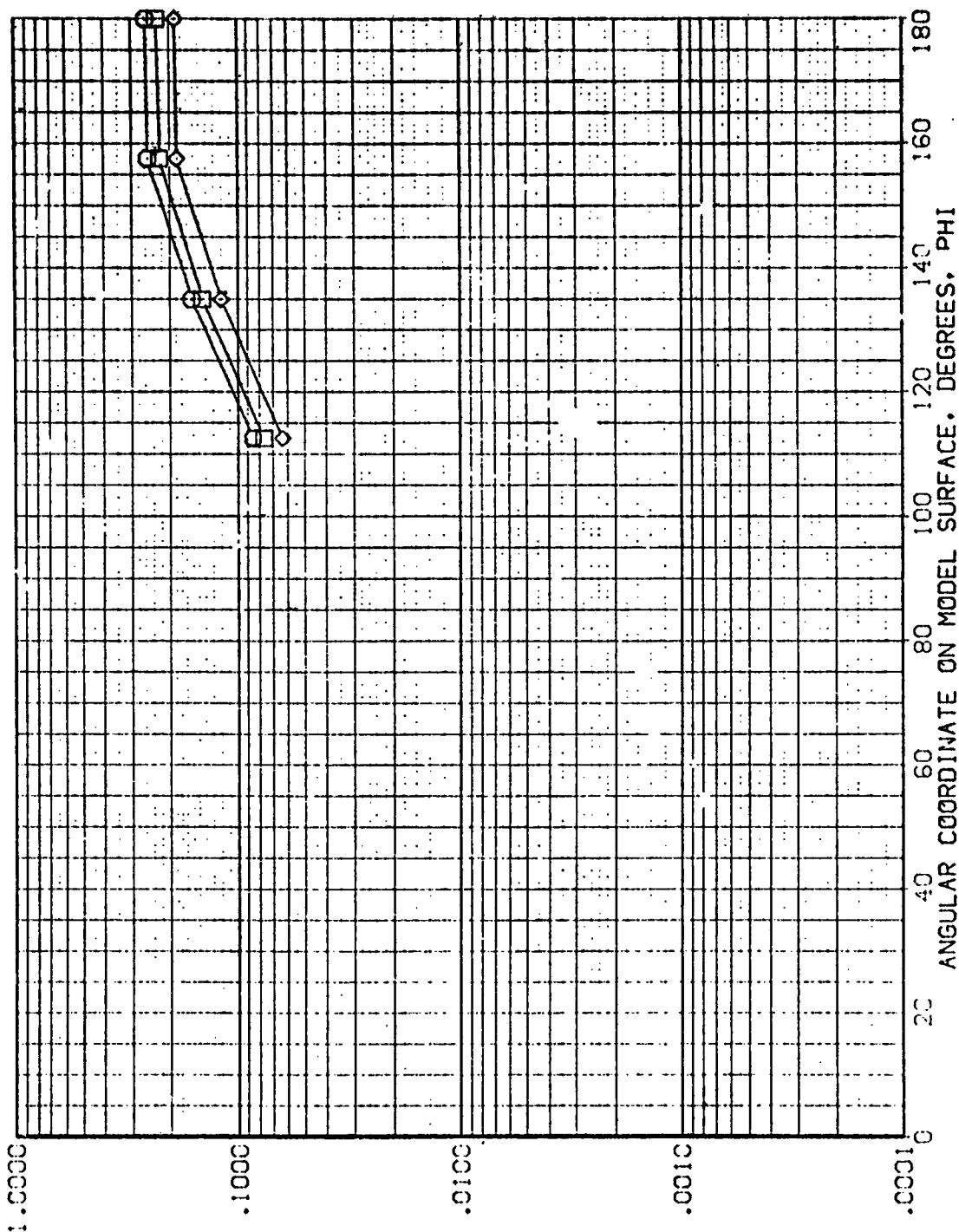


FIG. 4 TANK, ALONE

(REV118)

EXTERNAL TANK

AMES 3.5-195 IH28 T1

SYMBOL  
 ◇  
 ○  
 □

PARAMETER  
 H<sub>REF</sub>/T  
 .850  
 .900  
 1.000

X/L  
 .600

MACH  
 5.303

PARAMETRIC VALUES  
 ALPHA  
 R<sub>N</sub>/L  
 -93.000  
 4.000

BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

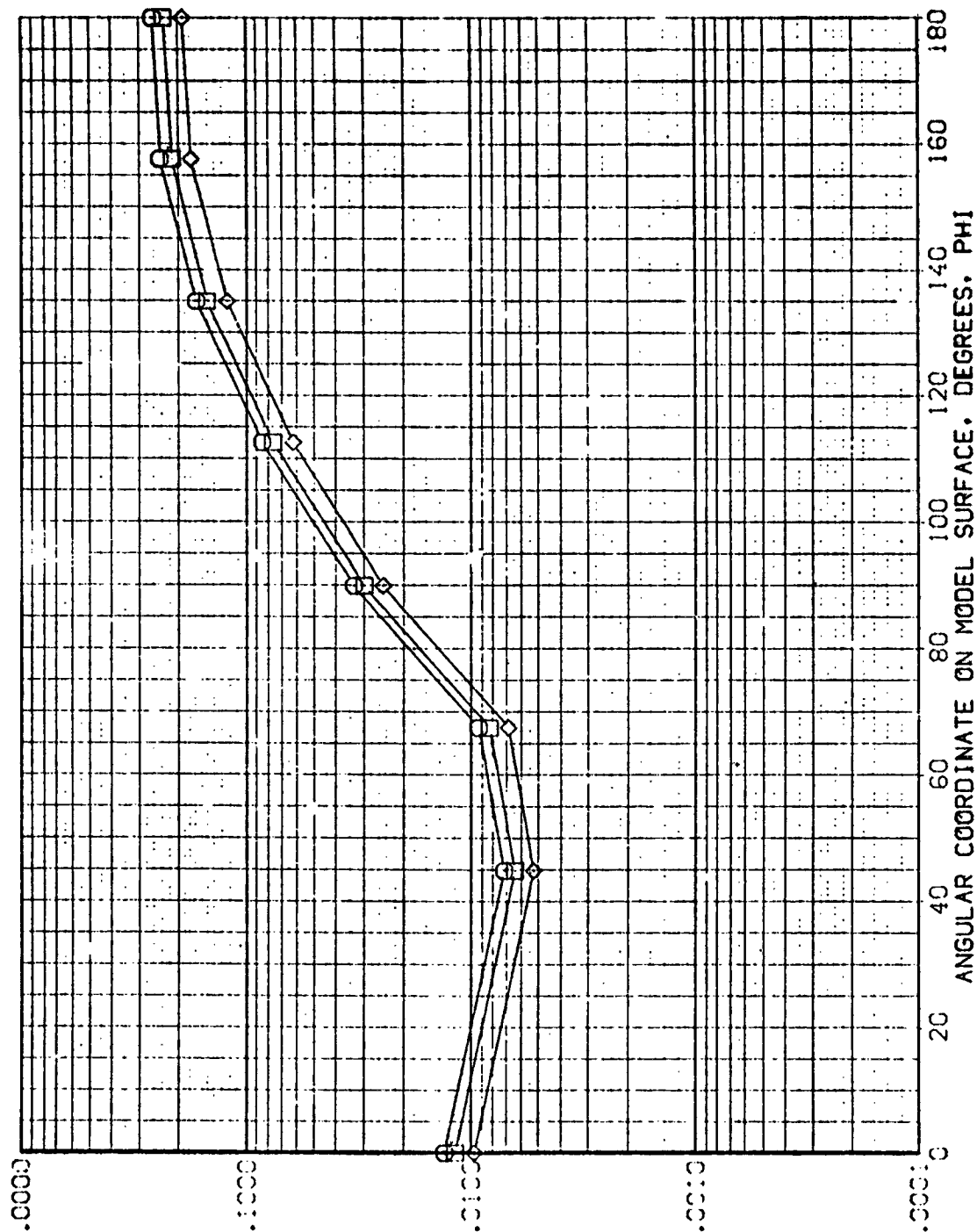


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1      EXTERNAL TANK      (REV T18)  
 SYMBOL    HAW/HT    X/L    MACH    ALPHA    BETA    .000  
              .85C    .65C    5.303    R<sub>N</sub>/L    4.000  
              .90C    1.00C

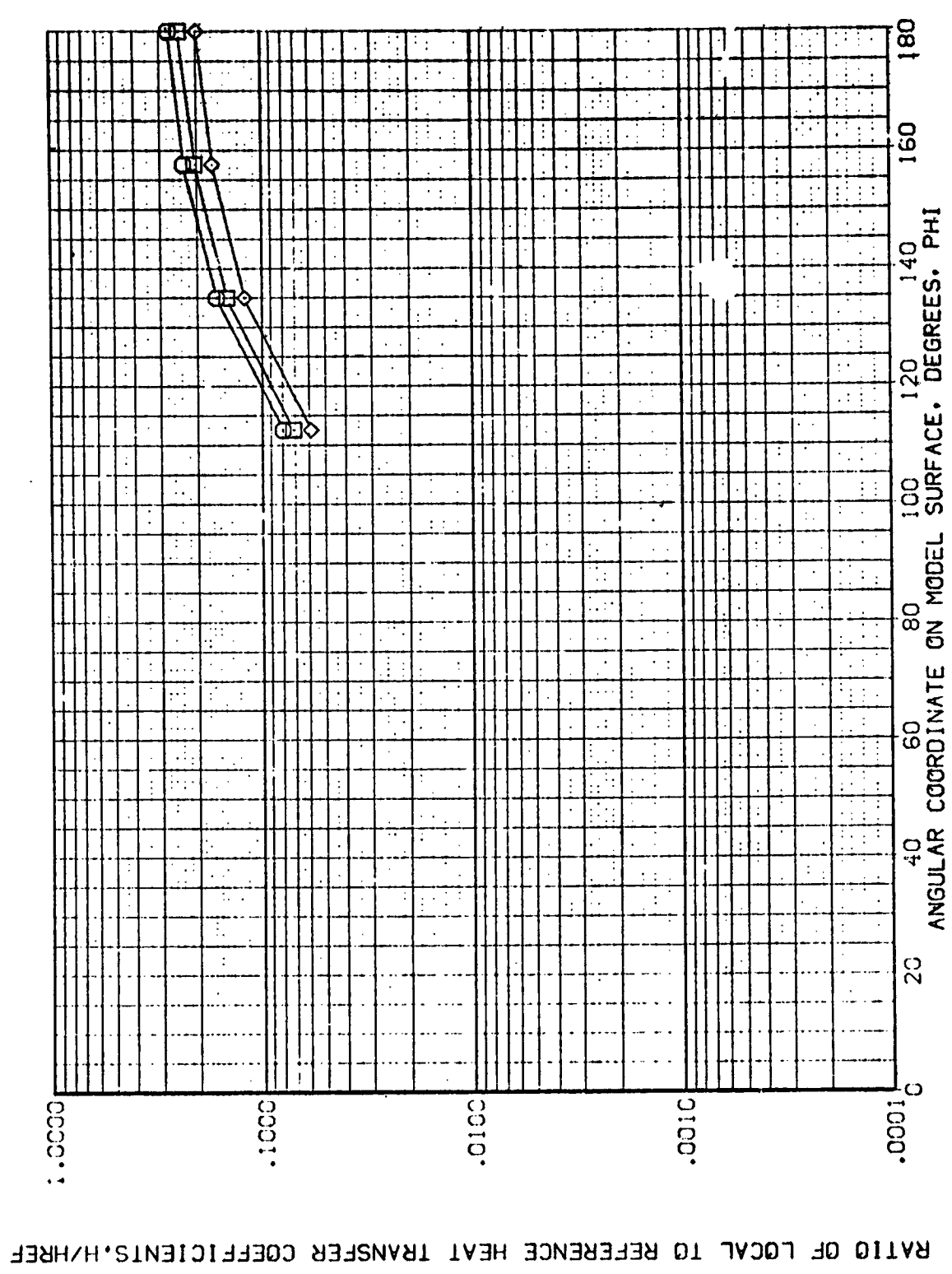


FIG. 4 TANK, ALONE

AMES 3.5-195 IH28 T1 EXTERNAL TANK

(REV118)

SYMBOL  
 □  
 ◇

HAIR/HT .850  
 V/L .700  
 MACH 5.303

PARAMETRIC VALUES  
 ALPHA 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

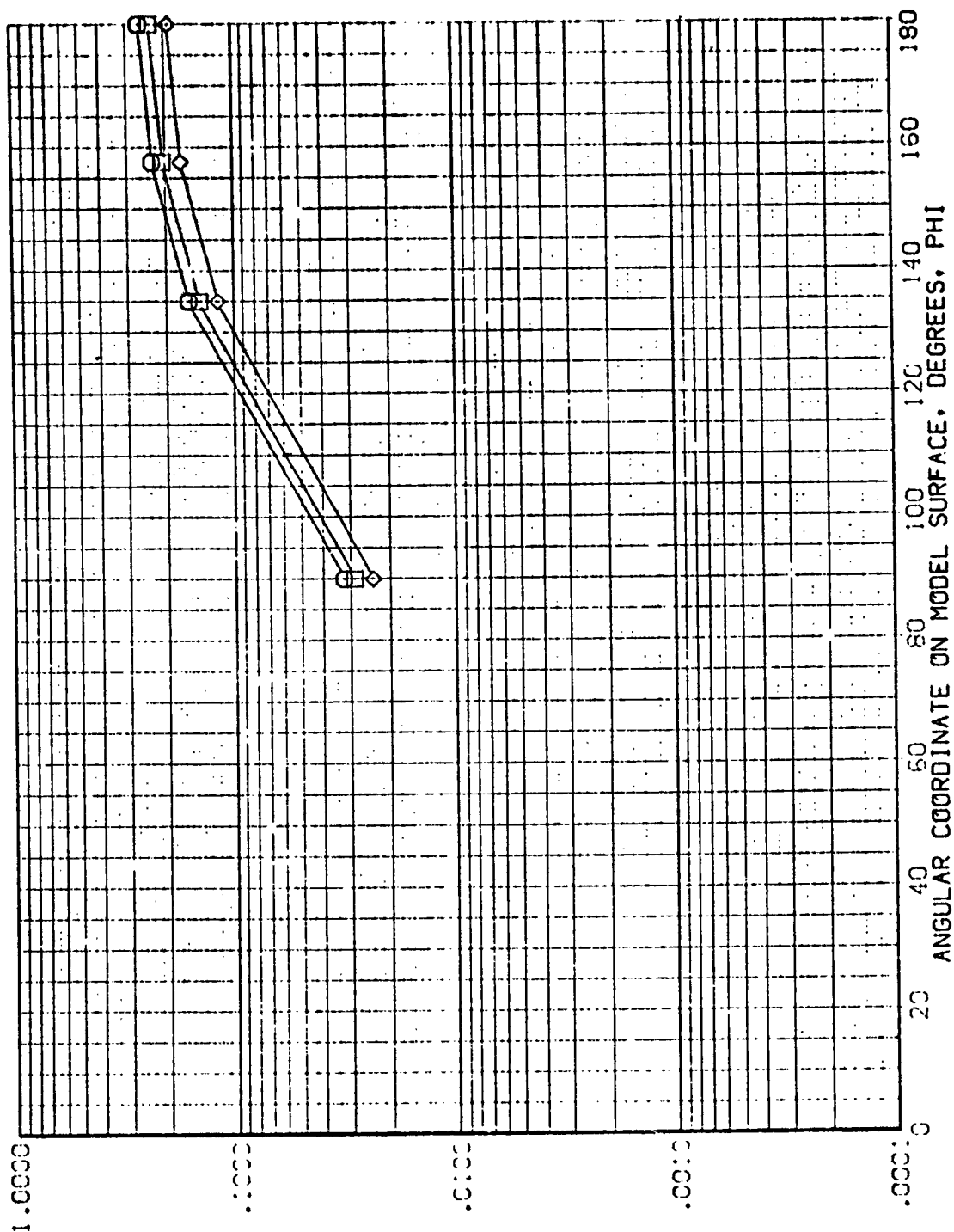


FIG. 4 TANK, ALONE

AMES 3.5-195 1H28 T1      EXTERNAL TANK      (REV T18)

SYNSEC	W/W/RT	X/L	MACH	PARAMETRIC VALUES
◇	.850	.750	5.303	ALPHA
□	.900			-90.00
◇	1.000			BETA
				4.000

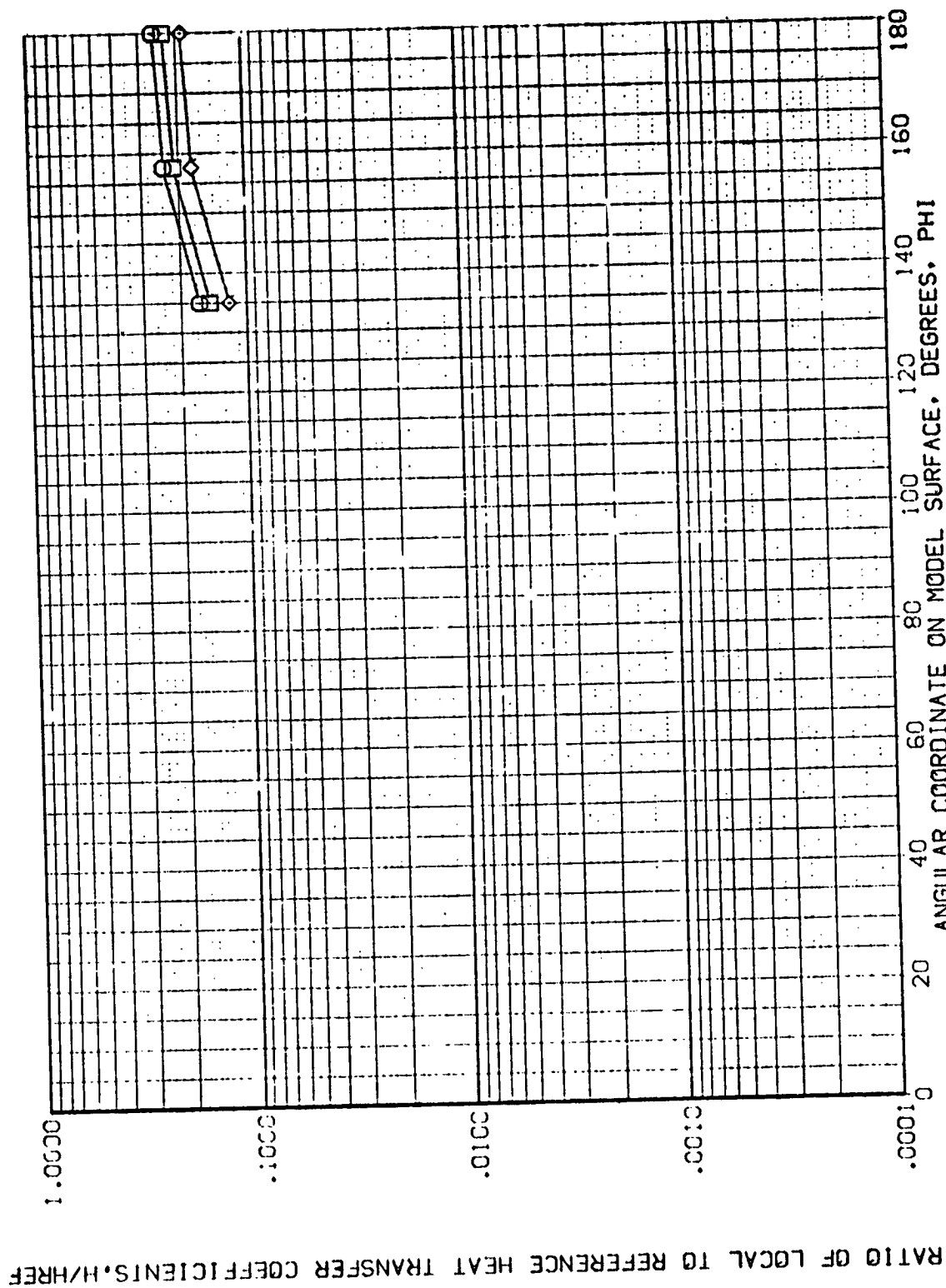


FIG. 4 TANK, ALONE



# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV118)

SYMBOL	PARAMETRIC VALUES
□	ALPHA
◇	BETA
	RV/L
	4.000
	4.000

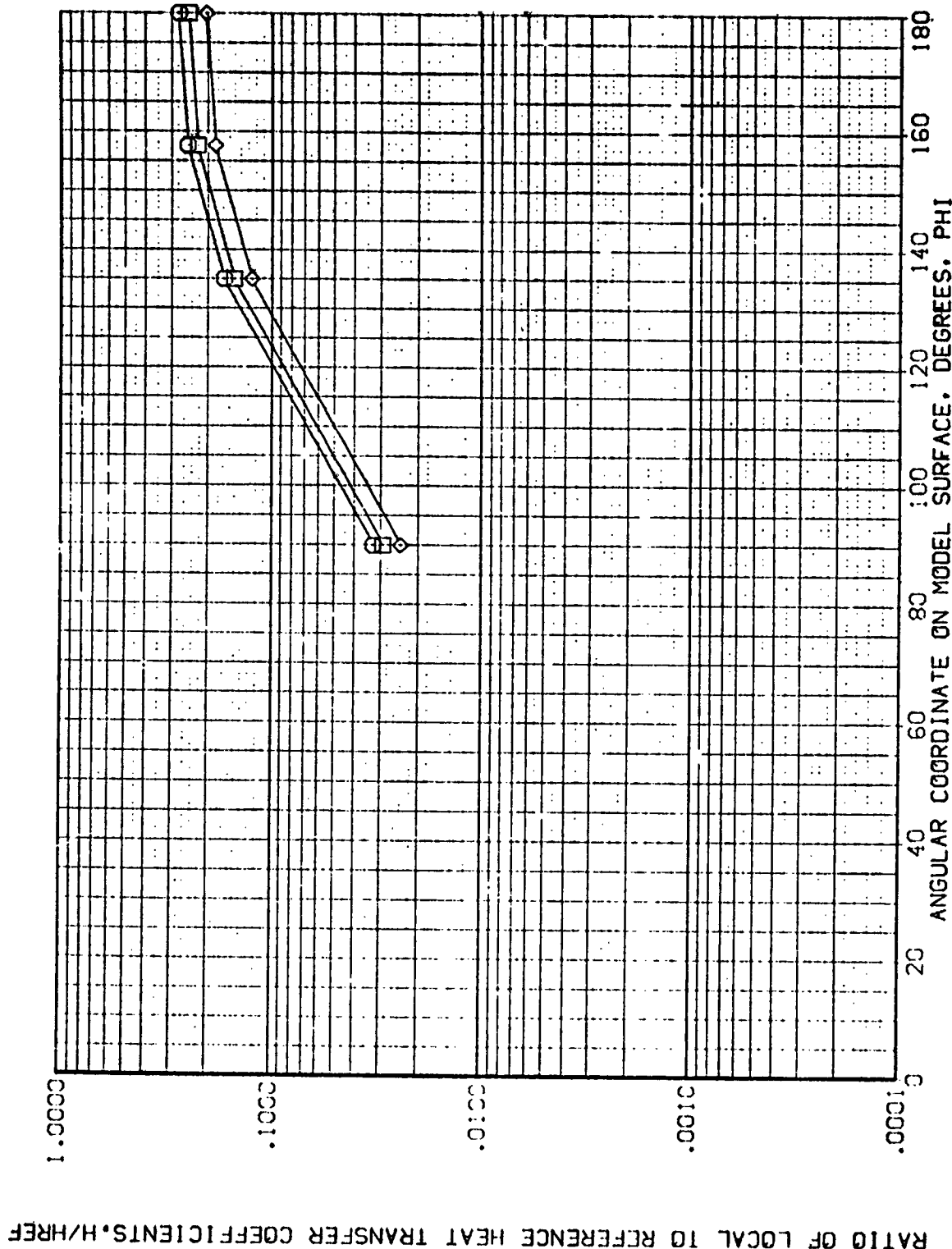


FIG. 4 TANK, ALONE

AMES 3.5-195 H28 T1      EXTERNAL TANK      (REVT18)

SIZE	WIND	X/L	MACH	PARAMETRIC VALUES
1.000	.850	.950	5.303	ALPHA
	.900			RN/L
	1.000			BETA

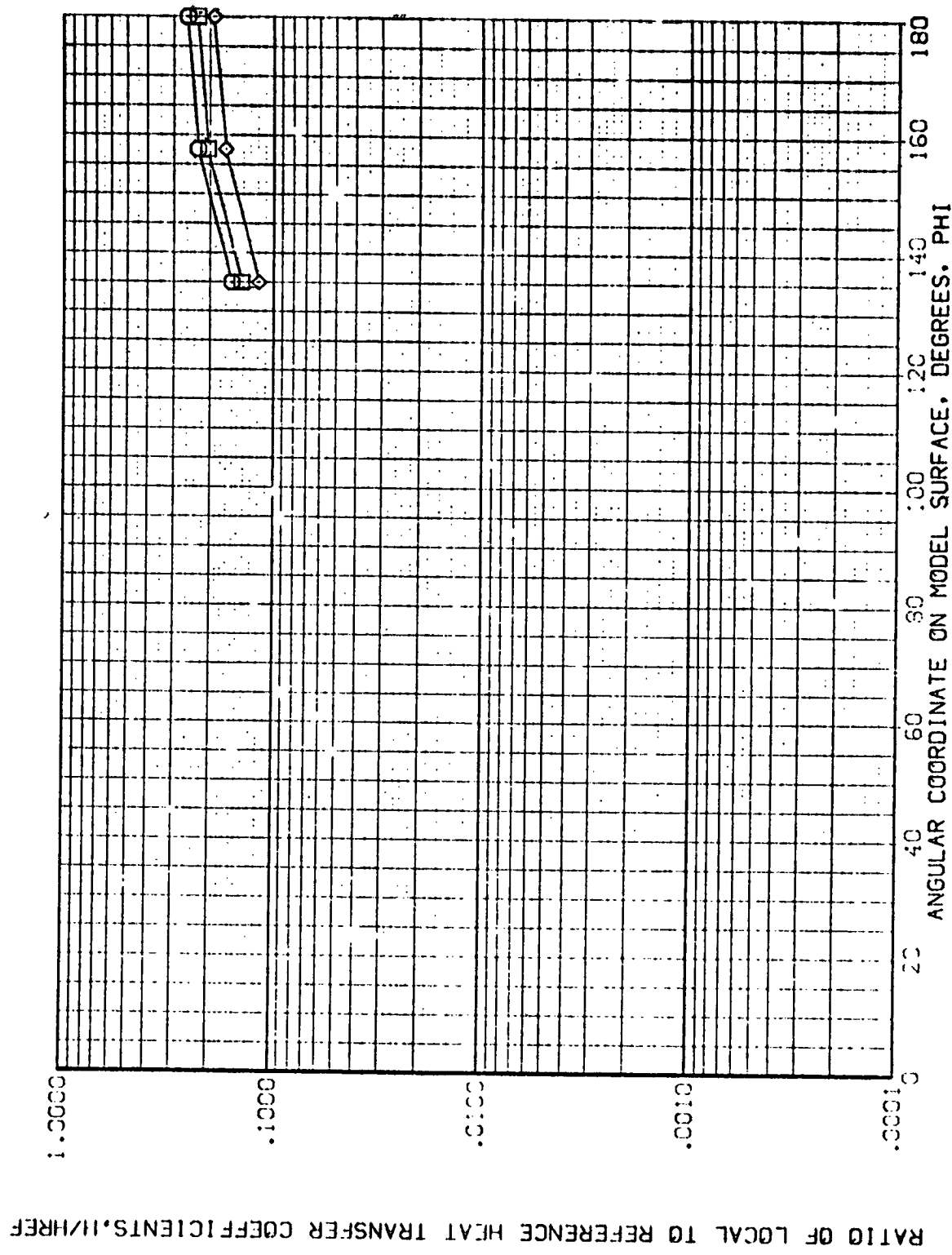


FIG. 4 TANK ALONE

# AMES 3.5-195 IH28 T1 EXTERNAL TANK (REV118)

SYMBOL H/W/H T X/L MACH  
 1.000 .850 .900 5.303  
 1.000 .900 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 P1/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

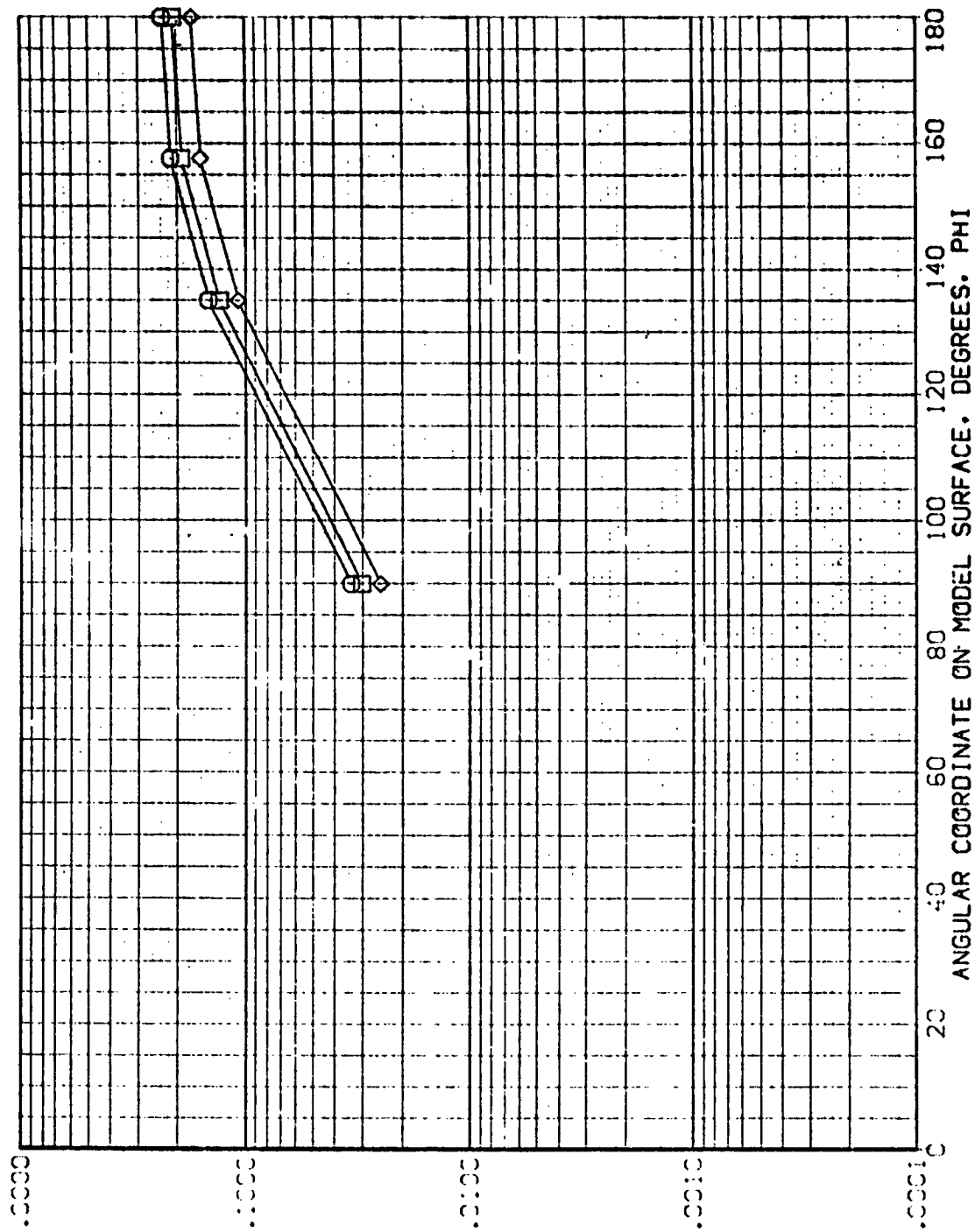
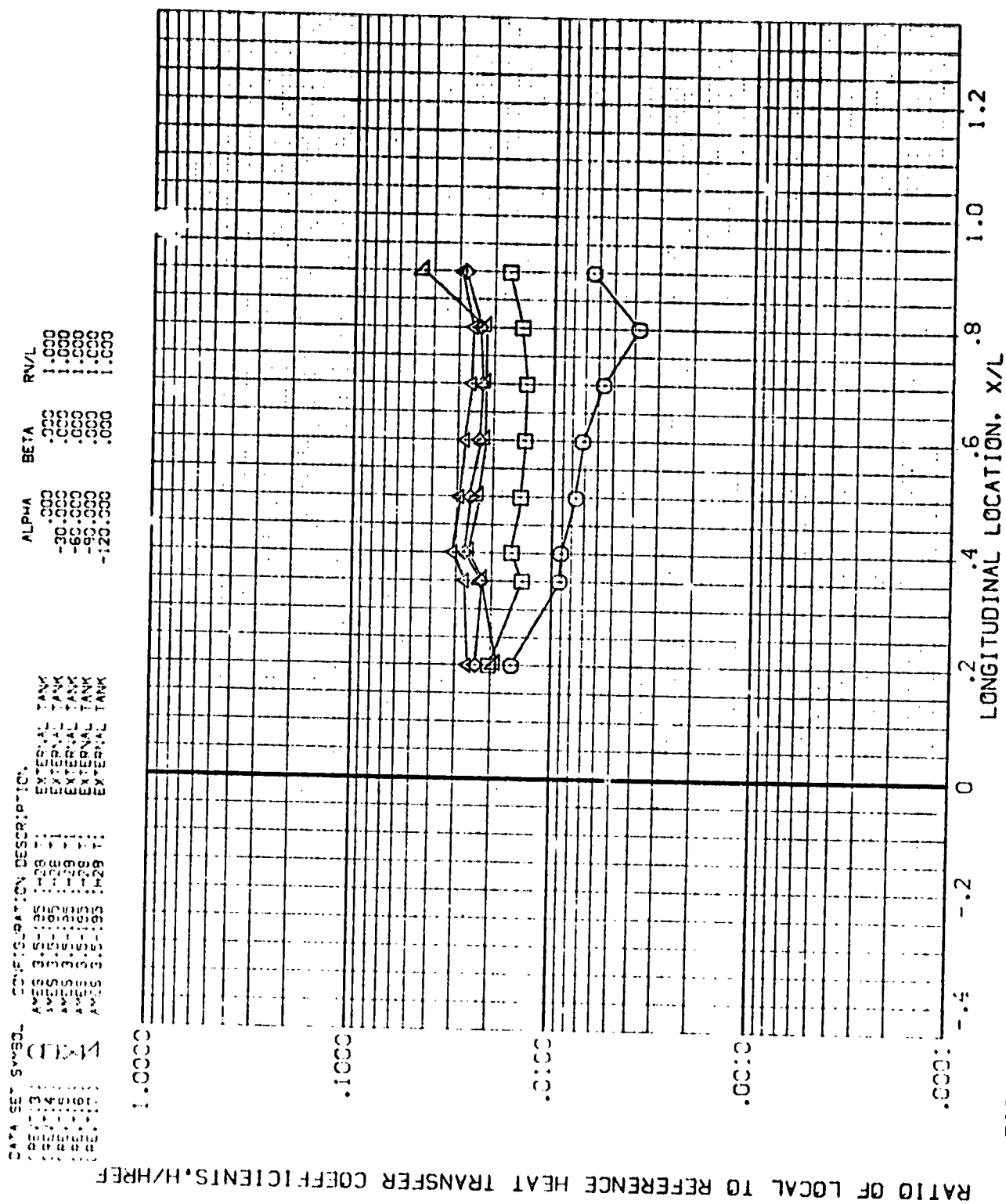


FIG. 4 TANK, ALONE



RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	PN/L
0000	EXTERNAL TANK	.000	.000	1.000
0001	EXTERNAL TANK	.000	.000	1.000
0002	EXTERNAL TANK	.000	.000	1.000
0003	EXTERNAL TANK	.000	.000	1.000
0004	EXTERNAL TANK	.000	.000	1.000
0005	EXTERNAL TANK	.000	.000	1.000
0006	EXTERNAL TANK	.000	.000	1.000
0007	EXTERNAL TANK	.000	.000	1.000
0008	EXTERNAL TANK	.000	.000	1.000
0009	EXTERNAL TANK	.000	.000	1.000
0010	EXTERNAL TANK	.000	.000	1.000
0011	EXTERNAL TANK	.000	.000	1.000
0012	EXTERNAL TANK	.000	.000	1.000
0013	EXTERNAL TANK	.000	.000	1.000
0014	EXTERNAL TANK	.000	.000	1.000
0015	EXTERNAL TANK	.000	.000	1.000
0016	EXTERNAL TANK	.000	.000	1.000
0017	EXTERNAL TANK	.000	.000	1.000
0018	EXTERNAL TANK	.000	.000	1.000
0019	EXTERNAL TANK	.000	.000	1.000
0020	EXTERNAL TANK	.000	.000	1.000
0021	EXTERNAL TANK	.000	.000	1.000
0022	EXTERNAL TANK	.000	.000	1.000
0023	EXTERNAL TANK	.000	.000	1.000
0024	EXTERNAL TANK	.000	.000	1.000
0025	EXTERNAL TANK	.000	.000	1.000
0026	EXTERNAL TANK	.000	.000	1.000
0027	EXTERNAL TANK	.000	.000	1.000
0028	EXTERNAL TANK	.000	.000	1.000
0029	EXTERNAL TANK	.000	.000	1.000
0030	EXTERNAL TANK	.000	.000	1.000
0031	EXTERNAL TANK	.000	.000	1.000
0032	EXTERNAL TANK	.000	.000	1.000
0033	EXTERNAL TANK	.000	.000	1.000
0034	EXTERNAL TANK	.000	.000	1.000
0035	EXTERNAL TANK	.000	.000	1.000
0036	EXTERNAL TANK	.000	.000	1.000
0037	EXTERNAL TANK	.000	.000	1.000
0038	EXTERNAL TANK	.000	.000	1.000
0039	EXTERNAL TANK	.000	.000	1.000
0040	EXTERNAL TANK	.000	.000	1.000
0041	EXTERNAL TANK	.000	.000	1.000
0042	EXTERNAL TANK	.000	.000	1.000
0043	EXTERNAL TANK	.000	.000	1.000
0044	EXTERNAL TANK	.000	.000	1.000
0045	EXTERNAL TANK	.000	.000	1.000
0046	EXTERNAL TANK	.000	.000	1.000
0047	EXTERNAL TANK	.000	.000	1.000
0048	EXTERNAL TANK	.000	.000	1.000
0049	EXTERNAL TANK	.000	.000	1.000
0050	EXTERNAL TANK	.000	.000	1.000
0051	EXTERNAL TANK	.000	.000	1.000
0052	EXTERNAL TANK	.000	.000	1.000
0053	EXTERNAL TANK	.000	.000	1.000
0054	EXTERNAL TANK	.000	.000	1.000
0055	EXTERNAL TANK	.000	.000	1.000
0056	EXTERNAL TANK	.000	.000	1.000
0057	EXTERNAL TANK	.000	.000	1.000
0058	EXTERNAL TANK	.000	.000	1.000
0059	EXTERNAL TANK	.000	.000	1.000
0060	EXTERNAL TANK	.000	.000	1.000
0061	EXTERNAL TANK	.000	.000	1.000
0062	EXTERNAL TANK	.000	.000	1.000
0063	EXTERNAL TANK	.000	.000	1.000
0064	EXTERNAL TANK	.000	.000	1.000
0065	EXTERNAL TANK	.000	.000	1.000
0066	EXTERNAL TANK	.000	.000	1.000
0067	EXTERNAL TANK	.000	.000	1.000
0068	EXTERNAL TANK	.000	.000	1.000
0069	EXTERNAL TANK	.000	.000	1.000
0070	EXTERNAL TANK	.000	.000	1.000
0071	EXTERNAL TANK	.000	.000	1.000
0072	EXTERNAL TANK	.000	.000	1.000
0073	EXTERNAL TANK	.000	.000	1.000
0074	EXTERNAL TANK	.000	.000	1.000
0075	EXTERNAL TANK	.000	.000	1.000
0076	EXTERNAL TANK	.000	.000	1.000
0077	EXTERNAL TANK	.000	.000	1.000
0078	EXTERNAL TANK	.000	.000	1.000
0079	EXTERNAL TANK	.000	.000	1.000
0080	EXTERNAL TANK	.000	.000	1.000
0081	EXTERNAL TANK	.000	.000	1.000
0082	EXTERNAL TANK	.000	.000	1.000
0083	EXTERNAL TANK	.000	.000	1.000
0084	EXTERNAL TANK	.000	.000	1.000
0085	EXTERNAL TANK	.000	.000	1.000
0086	EXTERNAL TANK	.000	.000	1.000
0087	EXTERNAL TANK	.000	.000	1.000
0088	EXTERNAL TANK	.000	.000	1.000
0089	EXTERNAL TANK	.000	.000	1.000
0090	EXTERNAL TANK	.000	.000	1.000
0091	EXTERNAL TANK	.000	.000	1.000
0092	EXTERNAL TANK	.000	.000	1.000
0093	EXTERNAL TANK	.000	.000	1.000
0094	EXTERNAL TANK	.000	.000	1.000
0095	EXTERNAL TANK	.000	.000	1.000
0096	EXTERNAL TANK	.000	.000	1.000
0097	EXTERNAL TANK	.000	.000	1.000
0098	EXTERNAL TANK	.000	.000	1.000
0099	EXTERNAL TANK	.000	.000	1.000

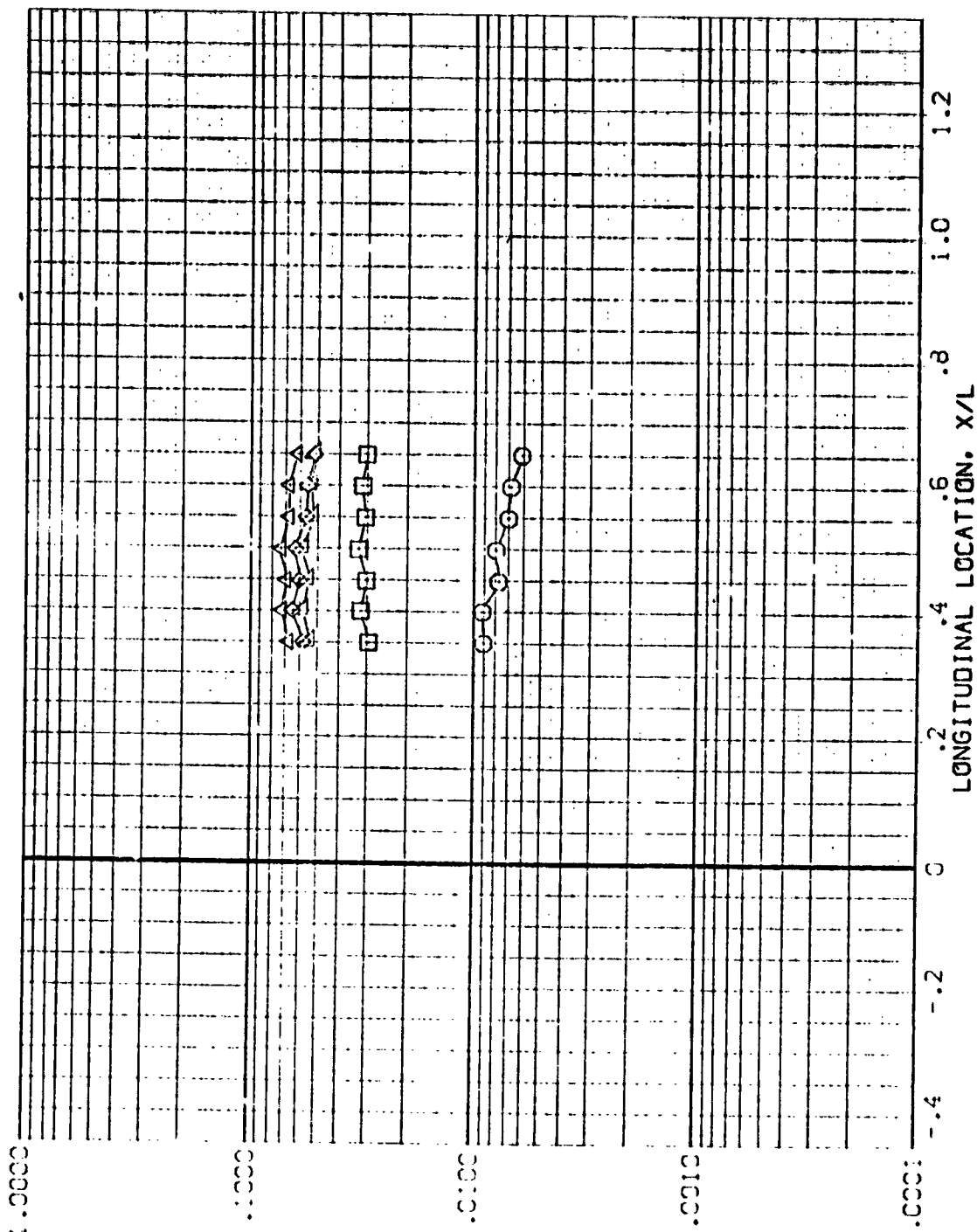
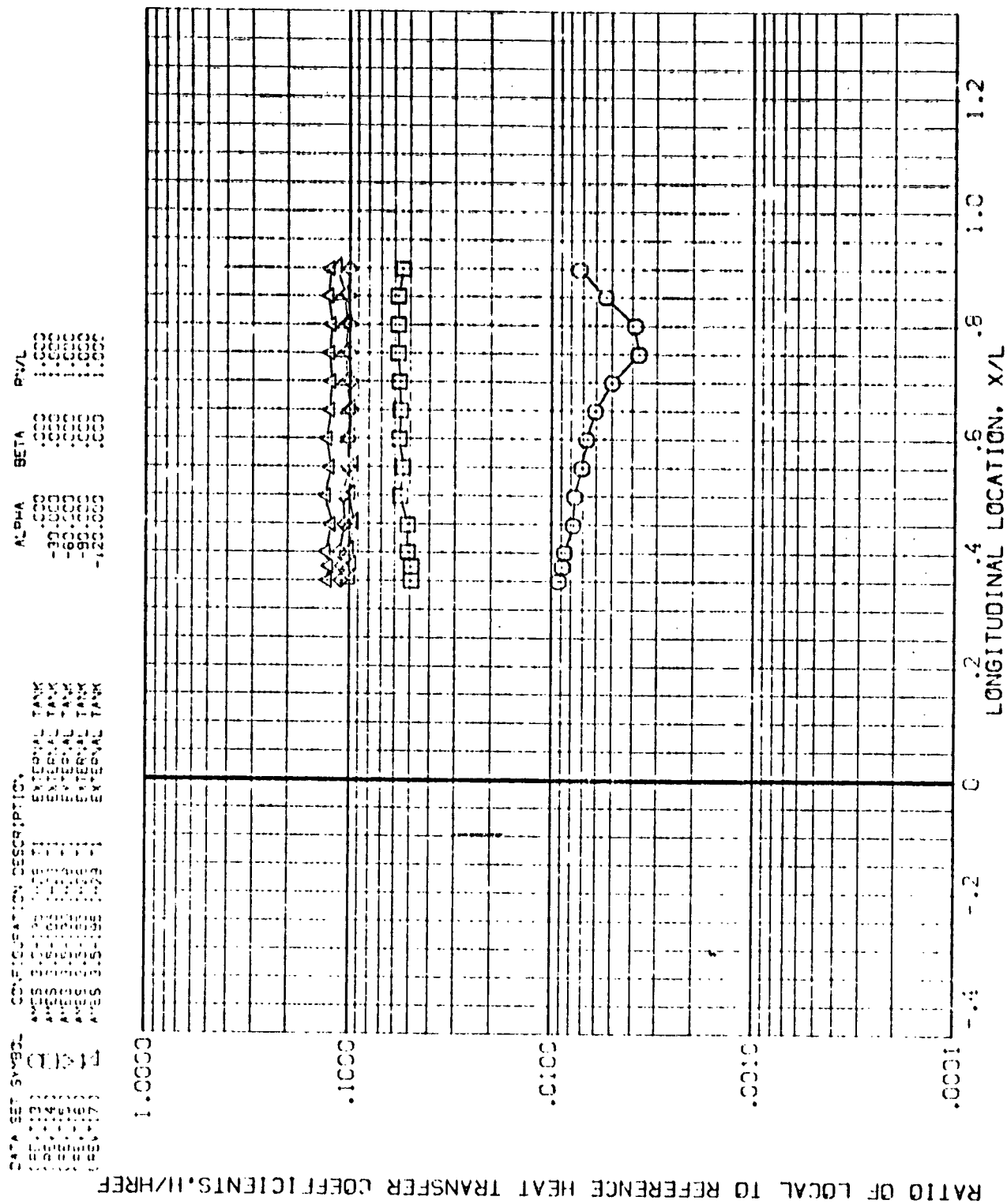


FIG. 4 TANK, ALONE

$\gamma_{ACH} = 5.300$   $\mu_{AX/H} = .900$   $\phi = 112.500$



DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (REV113) AYES 3.5-125 1428 T1 EXTERNAL TANK  
 (REV114) AYES 3.5-125 1428 T1 EXTERNAL TANK  
 (REV115) AYES 3.5-125 1428 T1 EXTERNAL TANK  
 (REV116) AYES 3.5-125 1428 T1 EXTERNAL TANK  
 (REV117) AYES 3.5-125 1428 T1 EXTERNAL TANK

ALPHA BETA<sup>2</sup> RI/L  
 .000 1.000  
 -30.000 1.000  
 -60.000 1.000  
 -90.000 1.000  
 -120.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

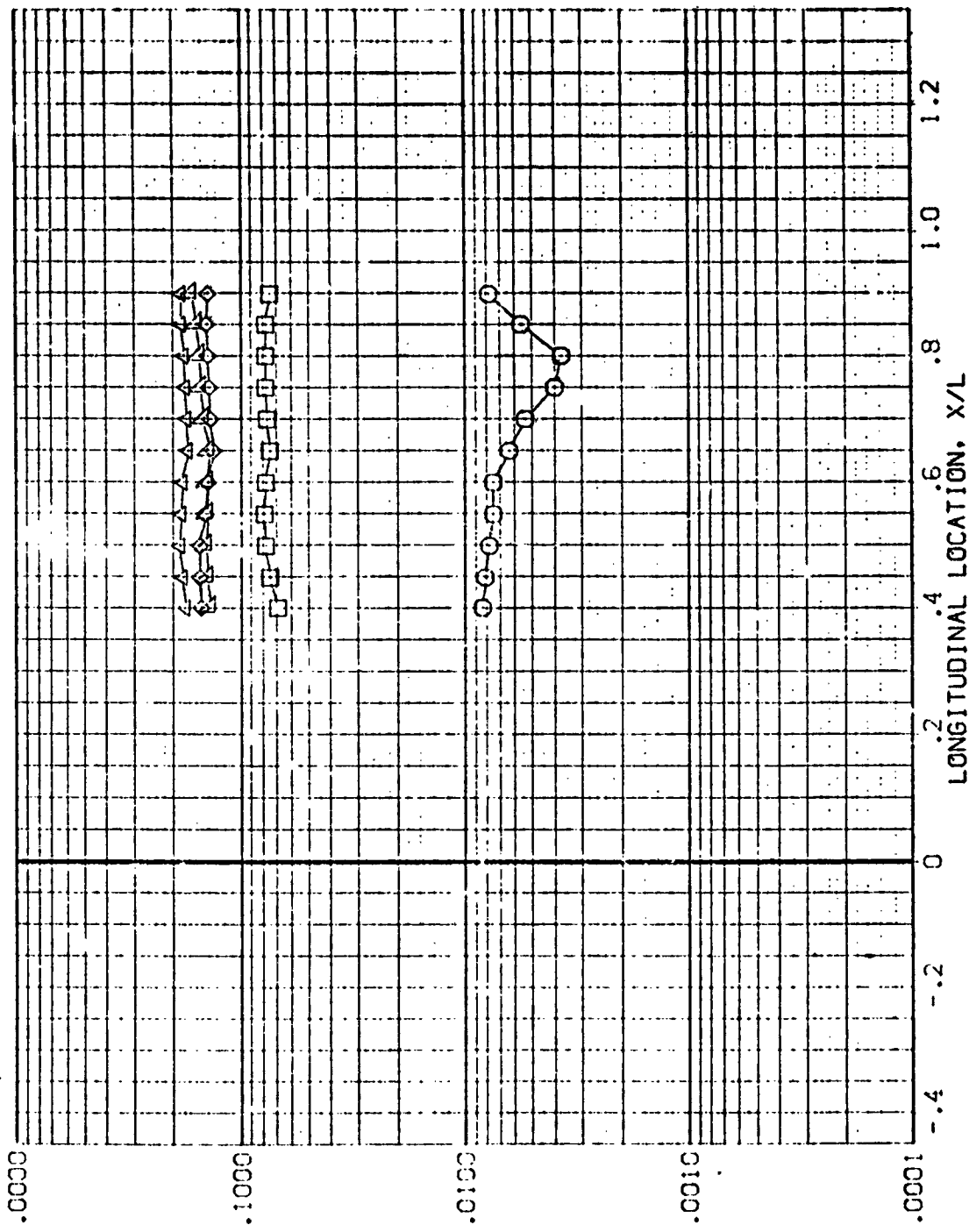


FIG. 4 TANK, ALONE

MACH = 5.300 WAW/HT = .900

PHI = 157.500

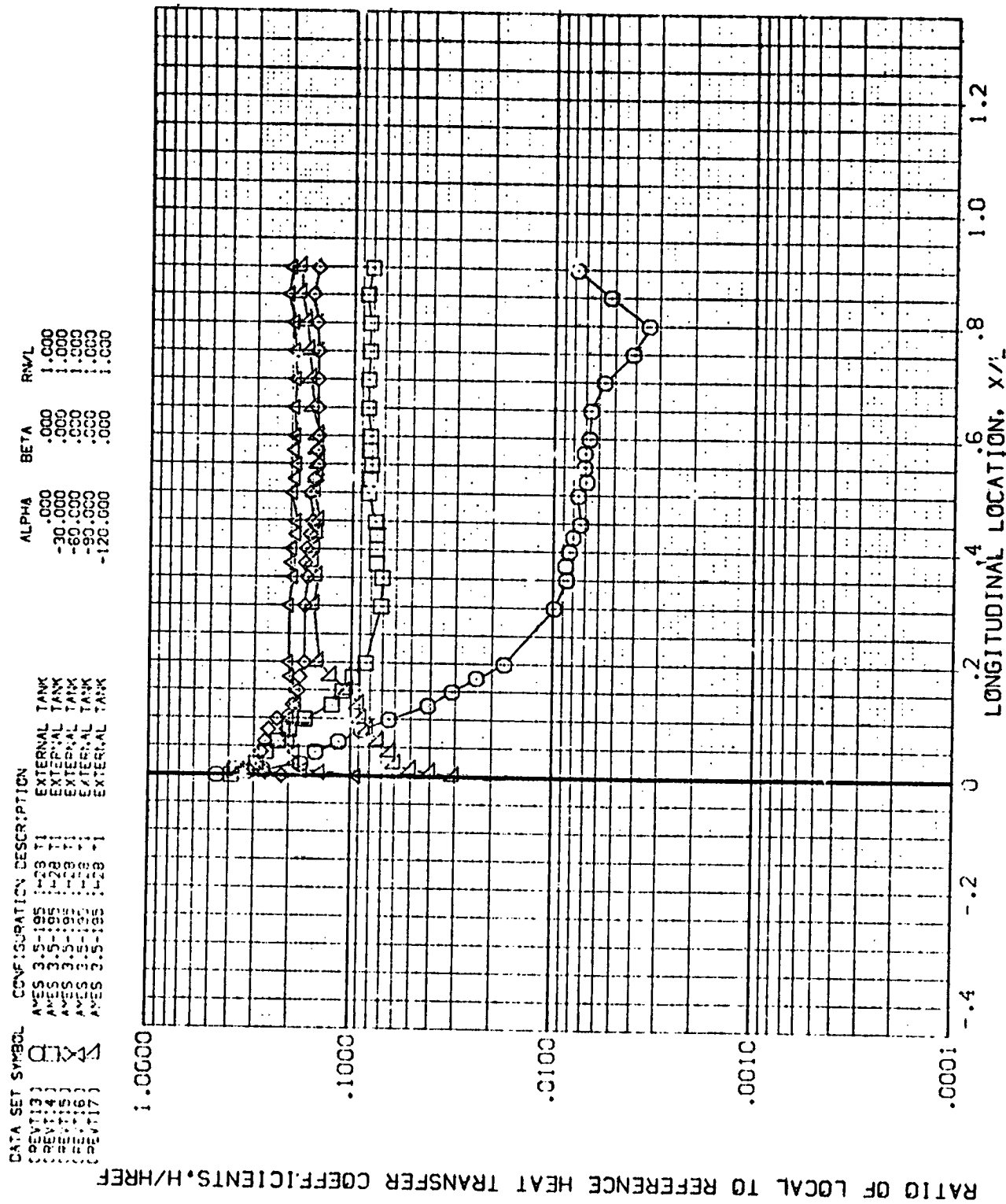


FIG. 4 TANK, ALONE

MACH = 5.300 HAW/HREF = .900 PHI = 180.000



DATA SET SYMBOL: Q  
 (REV16) AMES 3.5-195 1428 II  
 (REV18) AMES 3.5-195 1428 II

CONFIGURATION DESCRIPTION

ALPHA 190.000  
 BETA .000  
 RN/L 1.000  
 190.000  
 .000  
 4.000

EXTERNAL TANK  
 EXTERNAL TANK

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

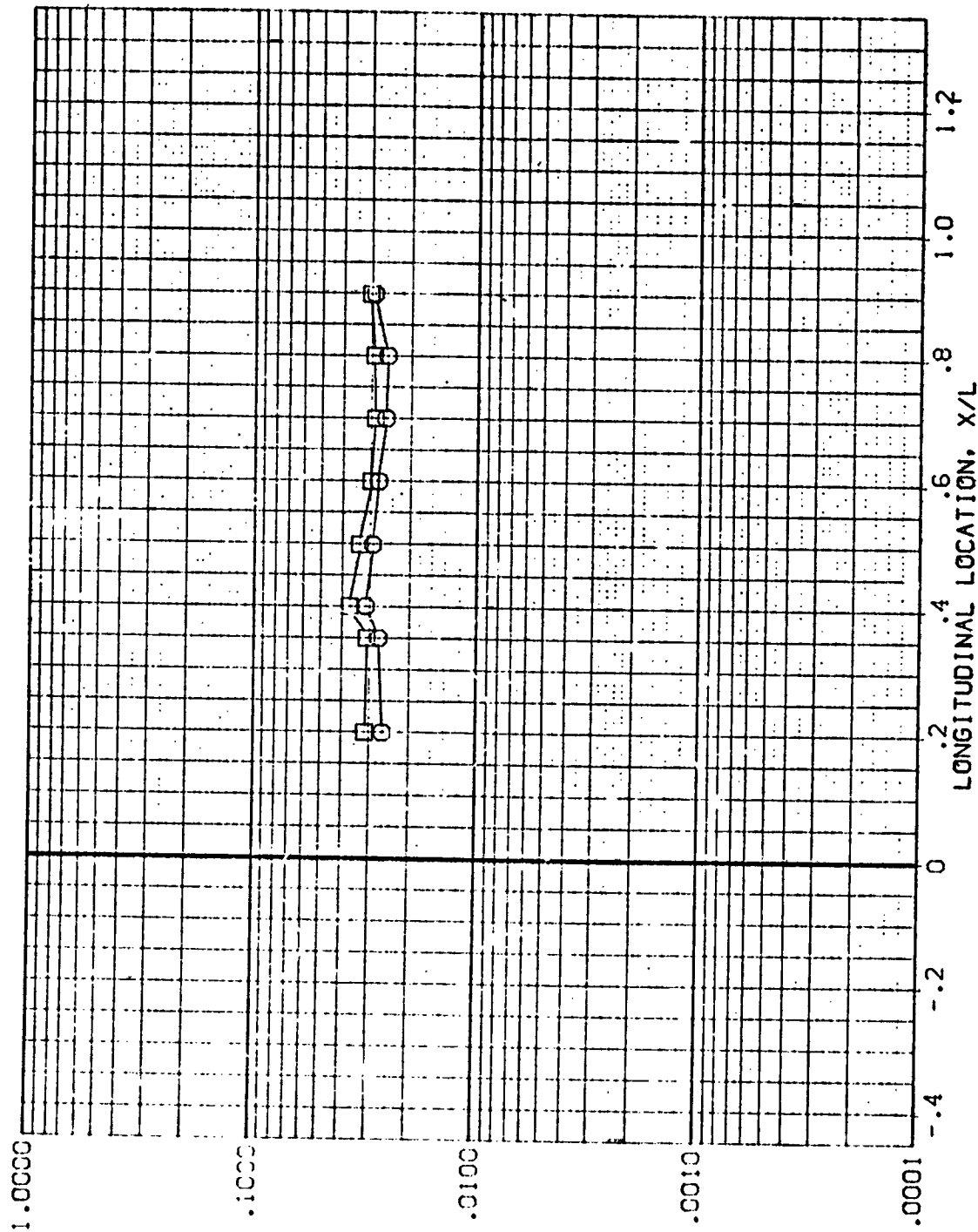


FIG. 4 TANK, ALONE

MACH = 5.300 HAW/HT =

.900 PHI = 90.000

DATA SET SYBOL CONFIGURATION DESCRIPTION  
 (REV116) AYES 3.5-195 1428 T1 EXTERNAL TANK  
 (REV118) AYES 3.5-195 1428 T1 EXTERNAL TANK

ALPHA BETA RI/L  
 -90.000 .000 1.000  
 -90.000 .000 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

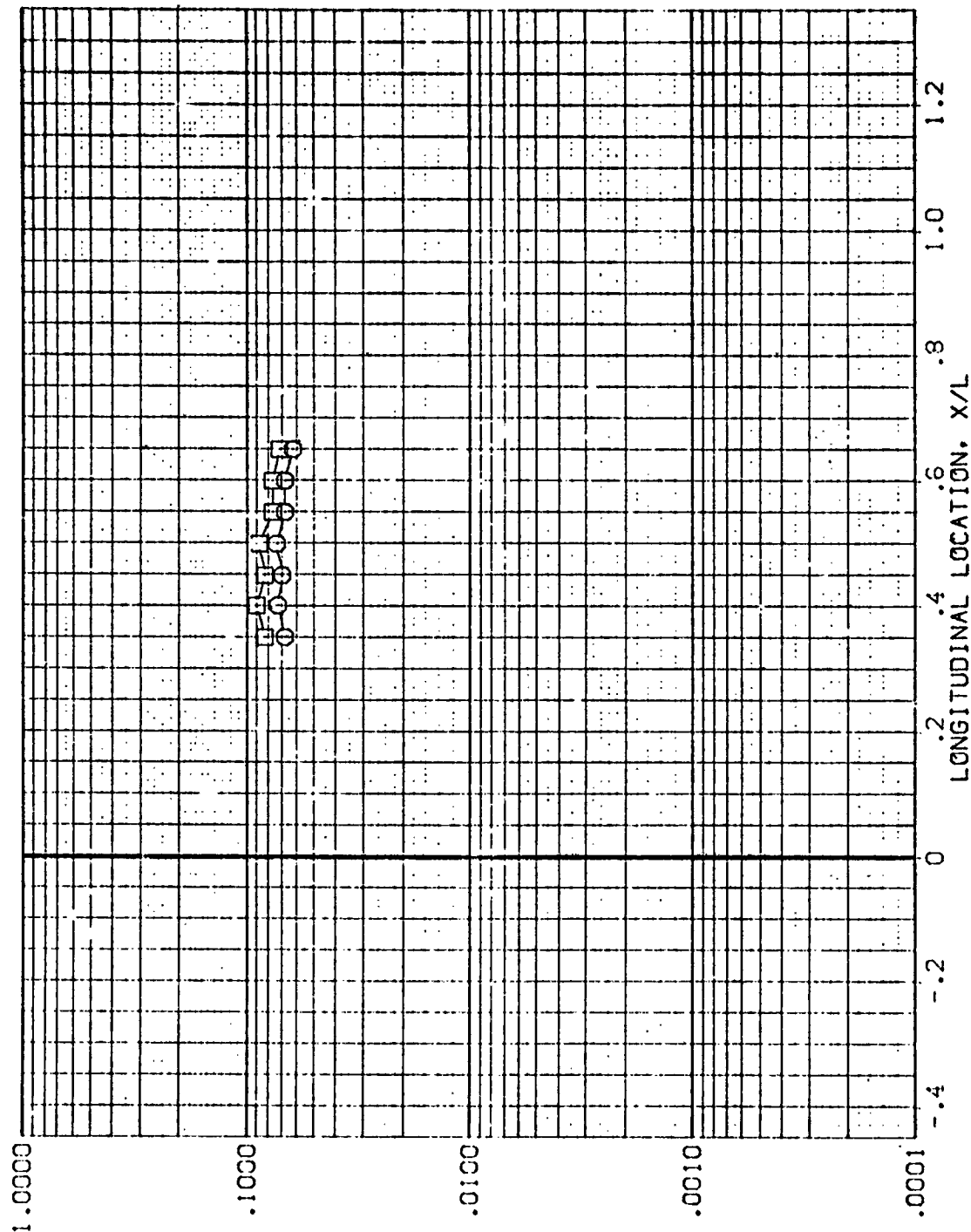


FIG. 4 TANK, ALONE

MACH = 5.300 HAW/HT = .900 PHI = 112.500

DATA SET SYMBOL  
 (REV116)  
 (REV118)

CONFIGURATION DESCRIPTION  
 AMES 3.5-195 1428 T1  
 AMES 3.5-195 1428 T1

EXTERNAL TANK  
 EXTERNAL TANK

ALPHA  
 -90.000  
 -90.000

BETA  
 .000  
 .000

RV/L  
 1.000  
 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

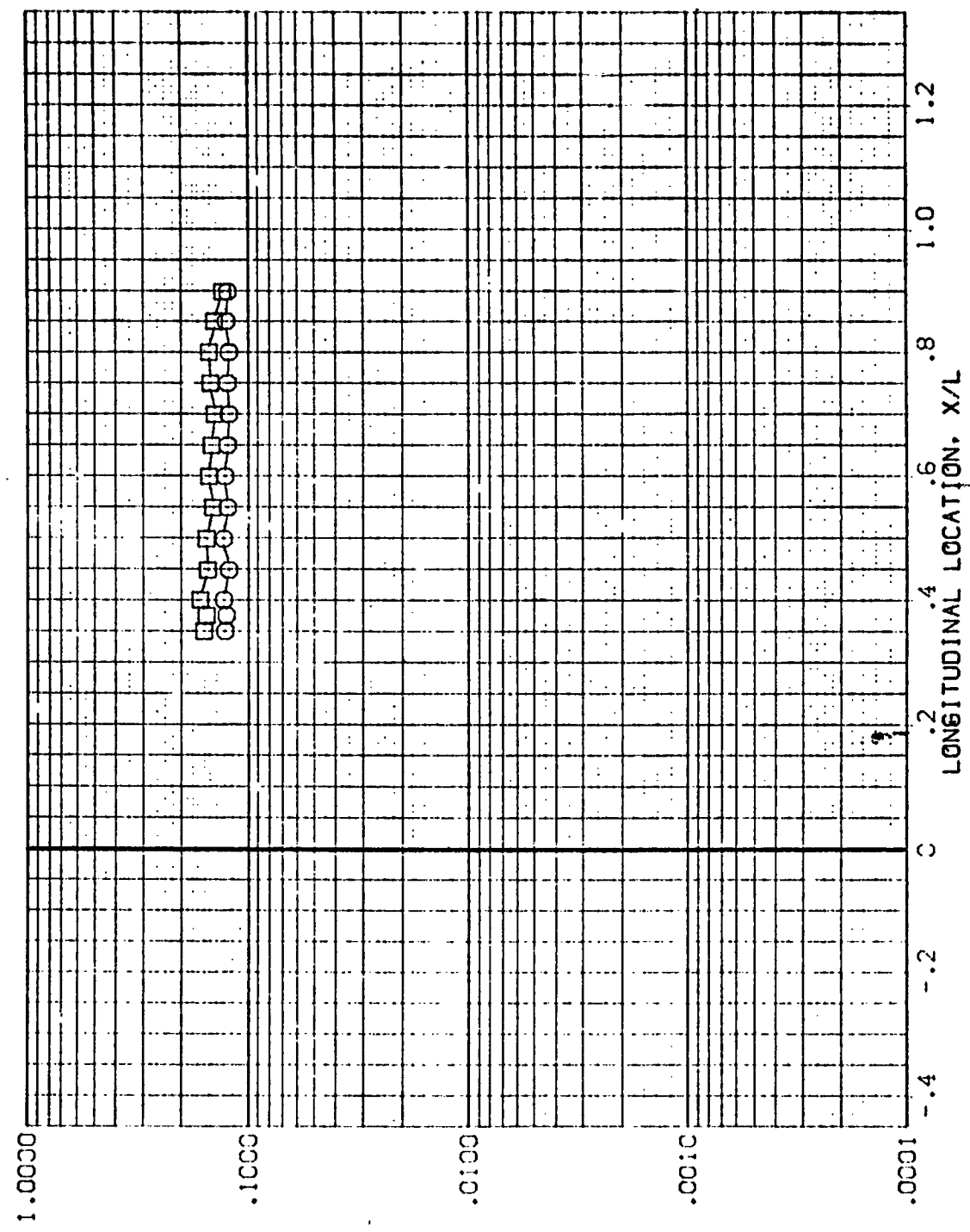


FIG. 4 TANK, ALONE

MACH = 5.300  $\frac{h_{w}/h_{\infty}}{h_{\infty}/h_{\infty}} =$

.900 PHI = 135.000

PAGE 110

REPRODUCIBILITY OF THE  
 ORIGINAL PAGE IS POOR

DATA SET SYMBOL    CONFIGURATION DESCRIPTION  
 (REV116)    8    AXES 3.5-195 1-28 T1    EXTERNAL TANK  
 (REV118)    8    AXES 3.5-195 1-23 T1    EXTERNAL TANK

ALPHA    BETA    RN/L  
 -90.000    .000    1.000  
 -90.000    .000    4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

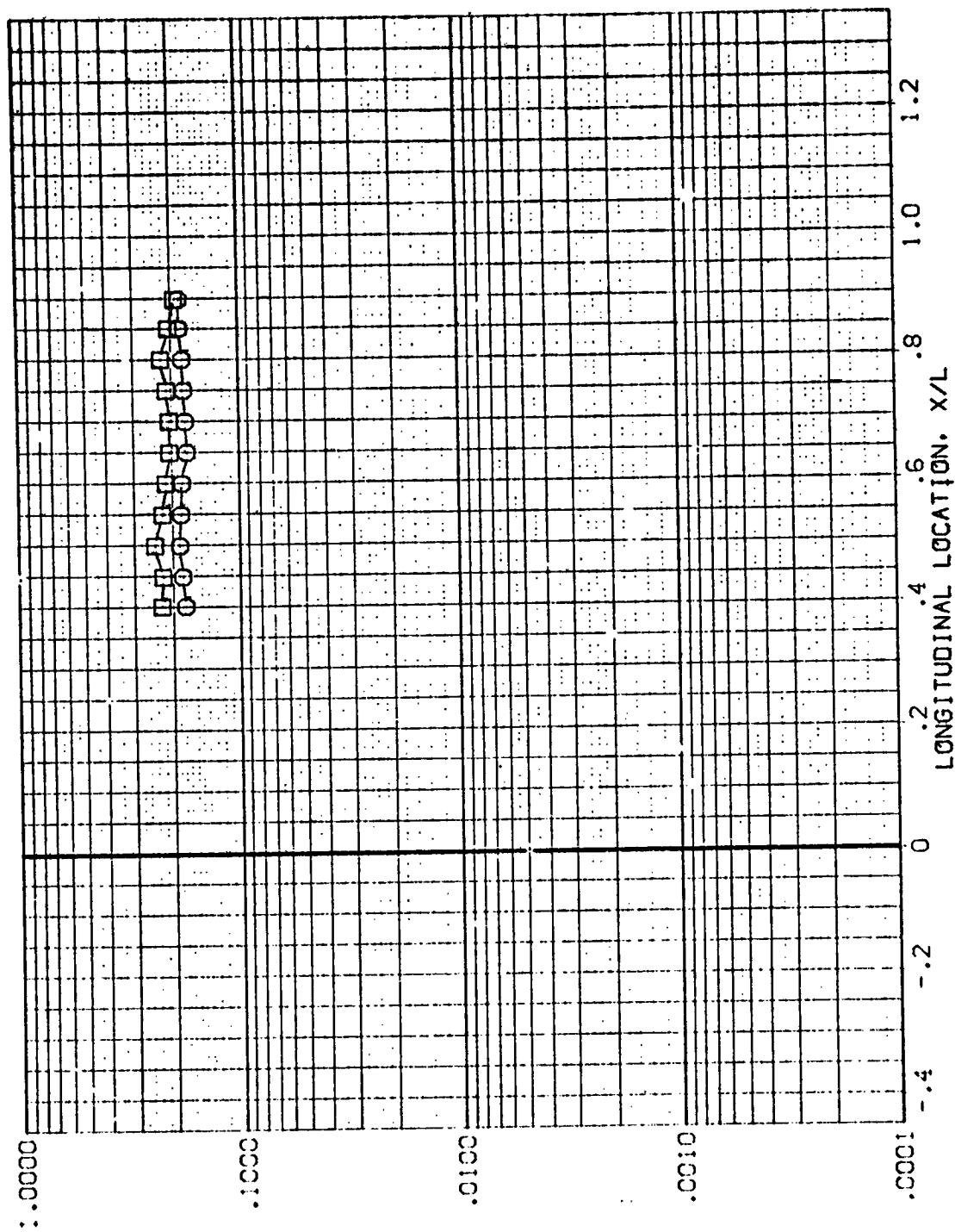


FIG. 4 TANK, ALONE

MACH = 5.300     $h_{AW}/h_{T=}$     .900    PHI = 157.500

DATA SET SYMBOL: B  
 (REV16) AMES 3.5-195 1428 II EXTERNAL TANK  
 (REV18) AMES 3.5-195 1428 II EXTERNAL TANK

ALPHA BETA RV/L  
 -50.000 .000 1.000  
 -50.000 .000 4.000

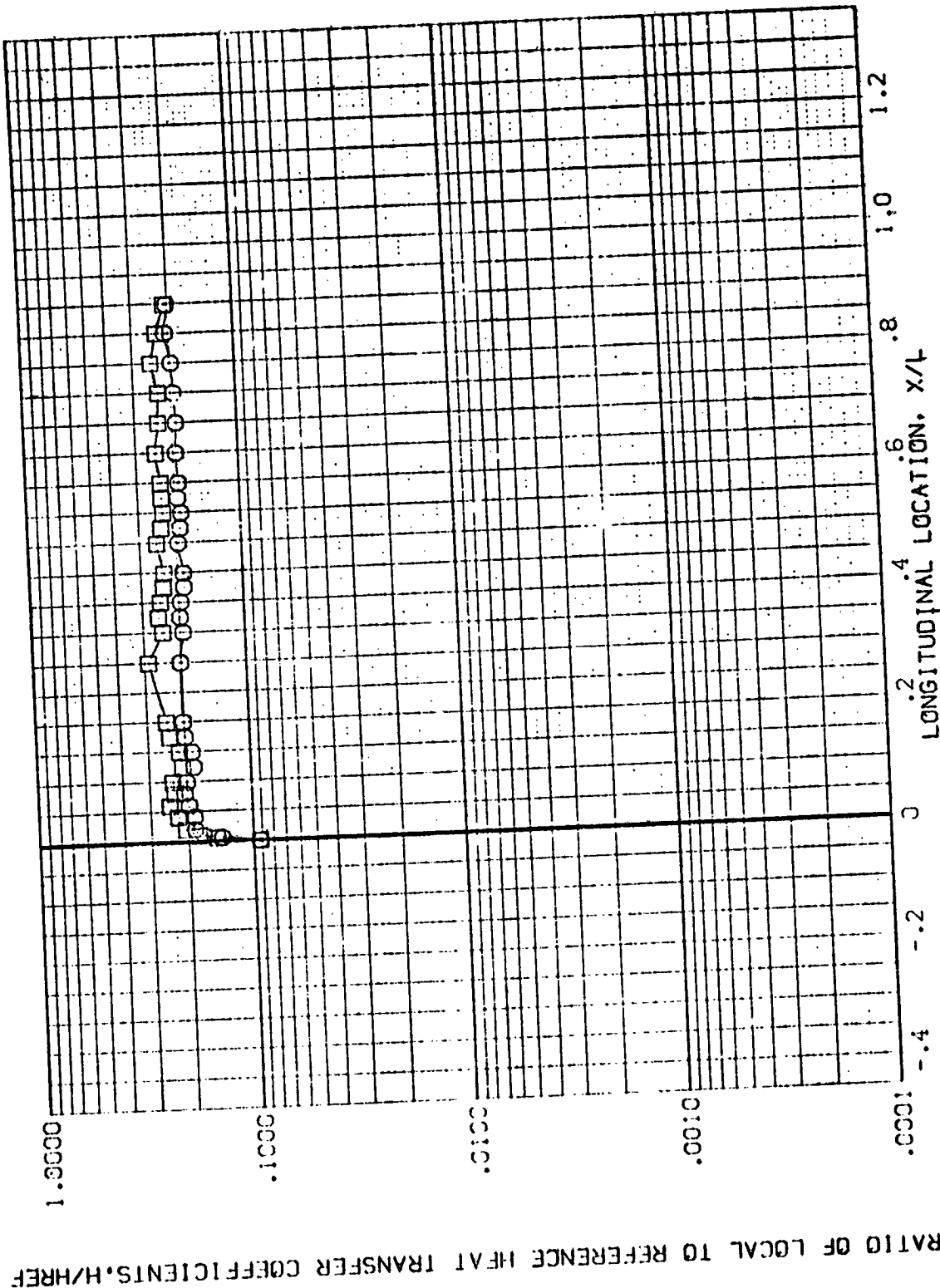


FIG. 4 TANK, ALONE

$\gamma_{AC} = 5.300$   $H_{AW}/H_T =$

.900

$\Phi_I =$

$= 180.000$

AMES 3.5-195 IH28 01+T: EXTERNAL TANK

(REVTO1)

SYMBOL  $\diamond$

MAE/WT .850  
PUL 90.000  
MACH 5.222  
.900  
1.000

PARAMETRIC VALUES  
ALPHA .000  
R1/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

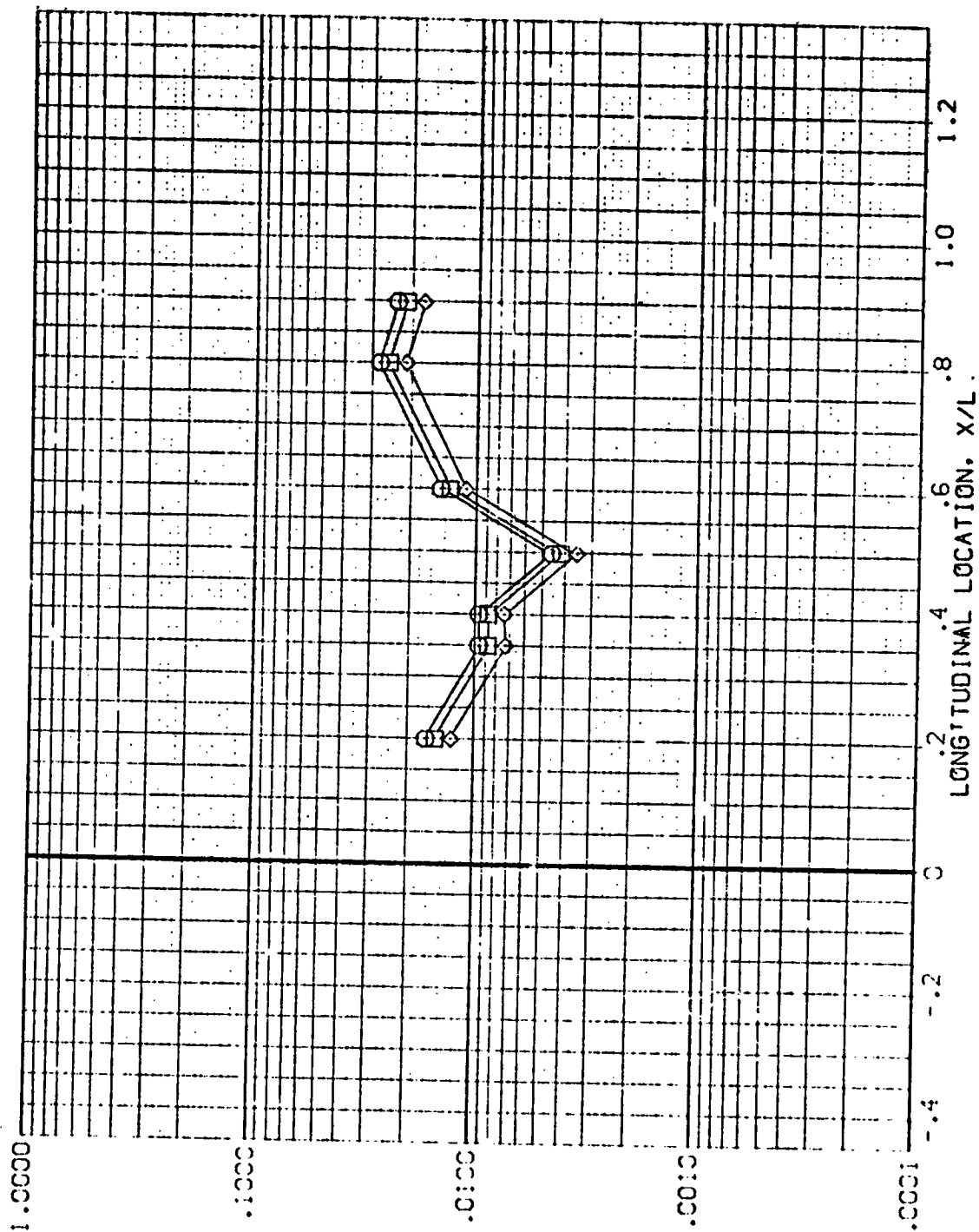


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-:95 IH28 01+T1 EXTERNAL TANK

(REVTO1)

SYNOPSIS  
 HAW/RT P-1 MACH  
 .850 1:2.500 5.222  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

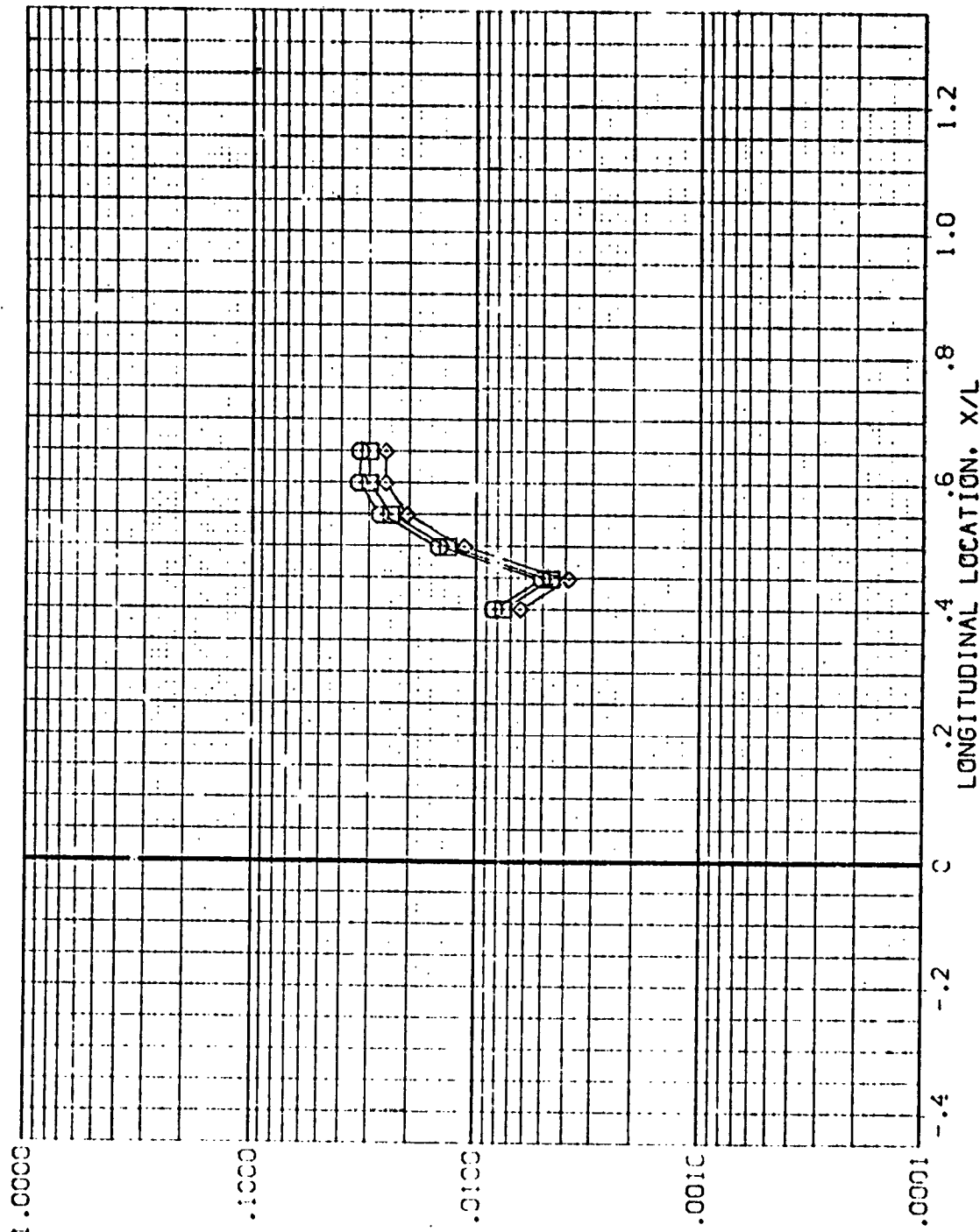


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T01)

SYMBOL H<sub>REF</sub>/T<sub>REF</sub> PH: MACH

◇ ◇ .850 135.000 5.222  
 .900  
 1.000

PARAMETER VALUES  
 .000  
 ALPHA .000  
 BETA 1.000  
 RN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

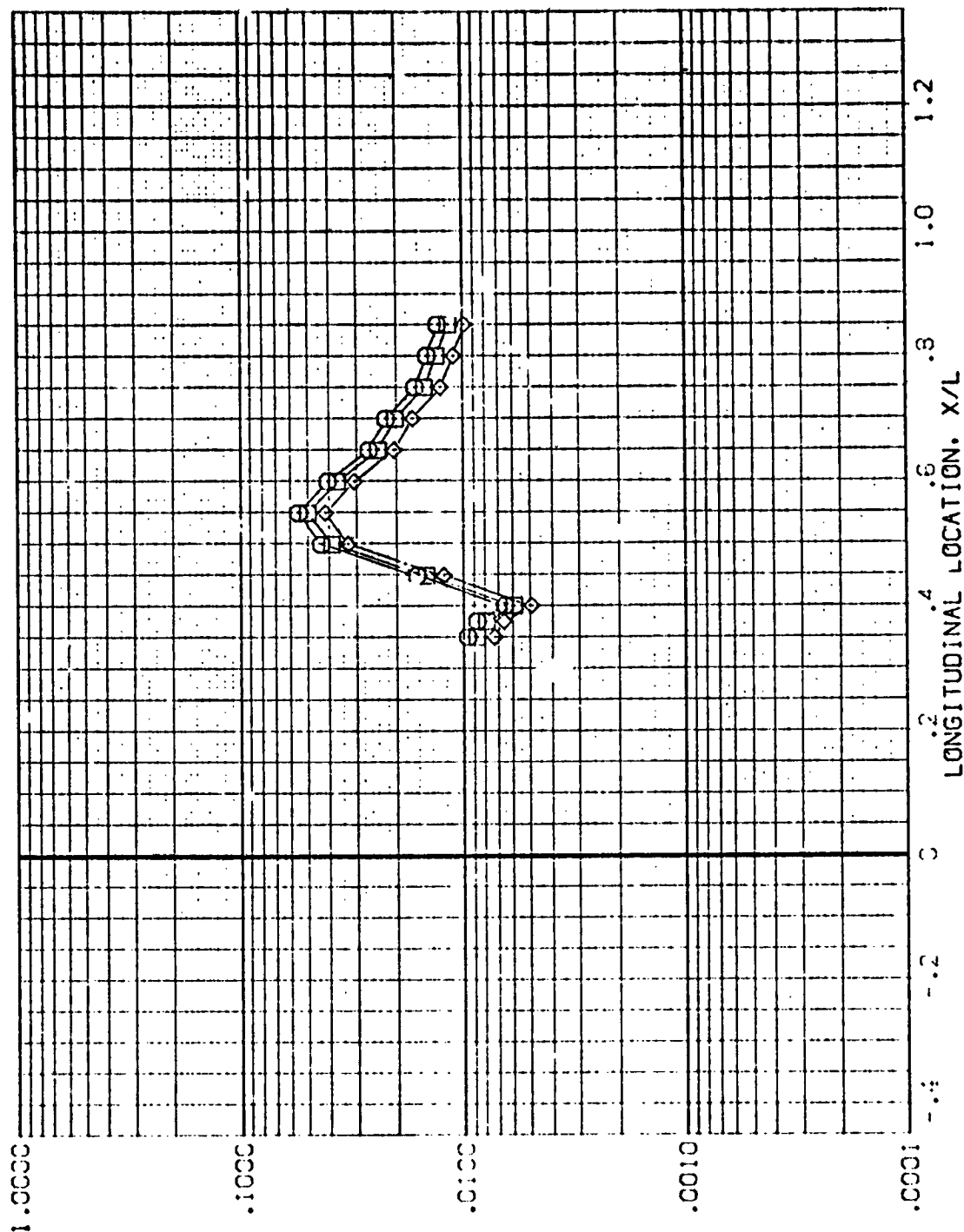


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



(REV T01)

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

SYMBOL HAW/HT PHI MACH  
 1.0 .850 157.500 5.222  
 .900  
 1.000

PARAMETRIC VALUES  
 .000 BETA  
 1.000  
 .000 ALPHA  
 PN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

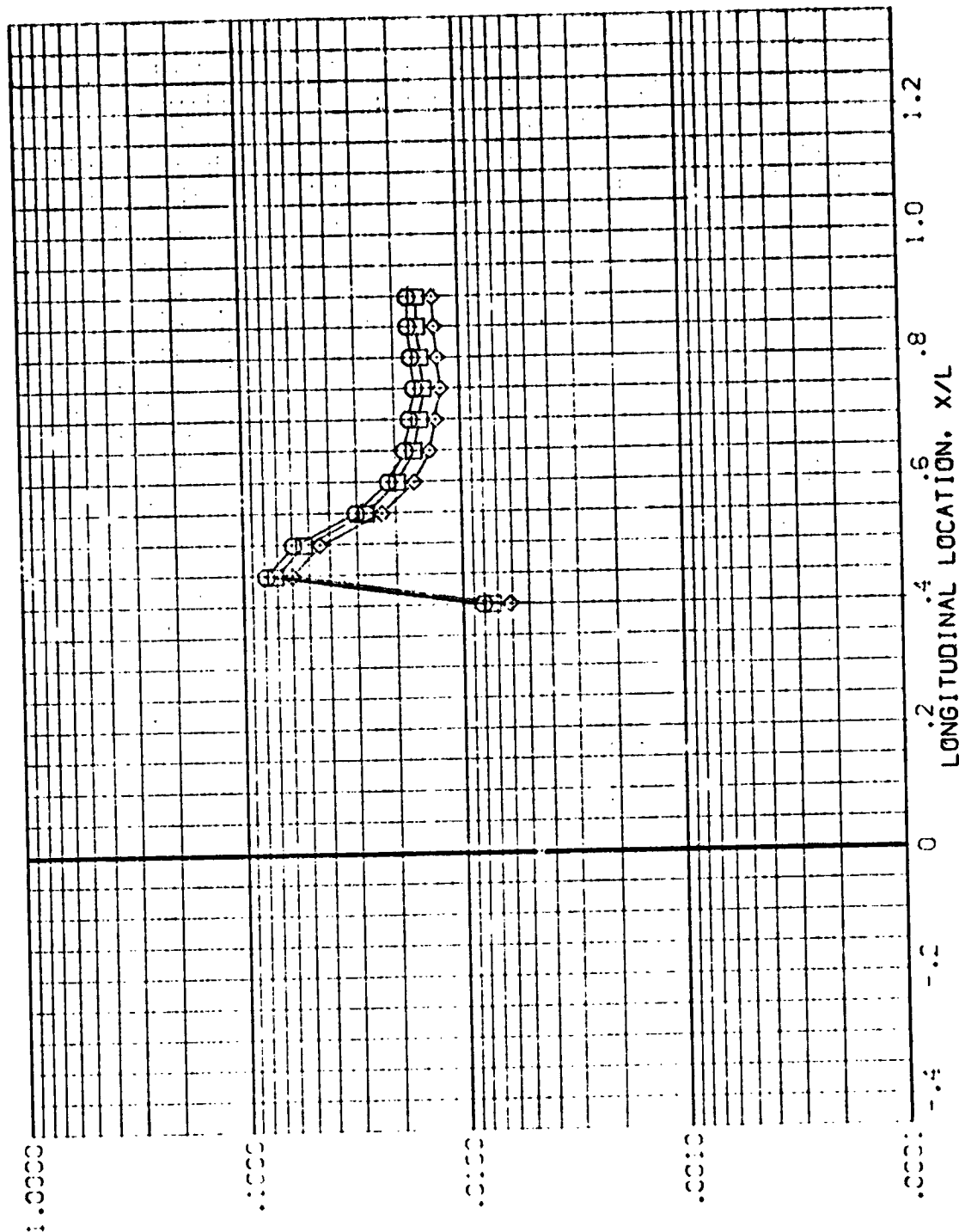


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-:05 : -28 CI+T1 EXTERNAL TANK

```
PARAMETRIC VALUES
.000 BETA
.000
1.000
```

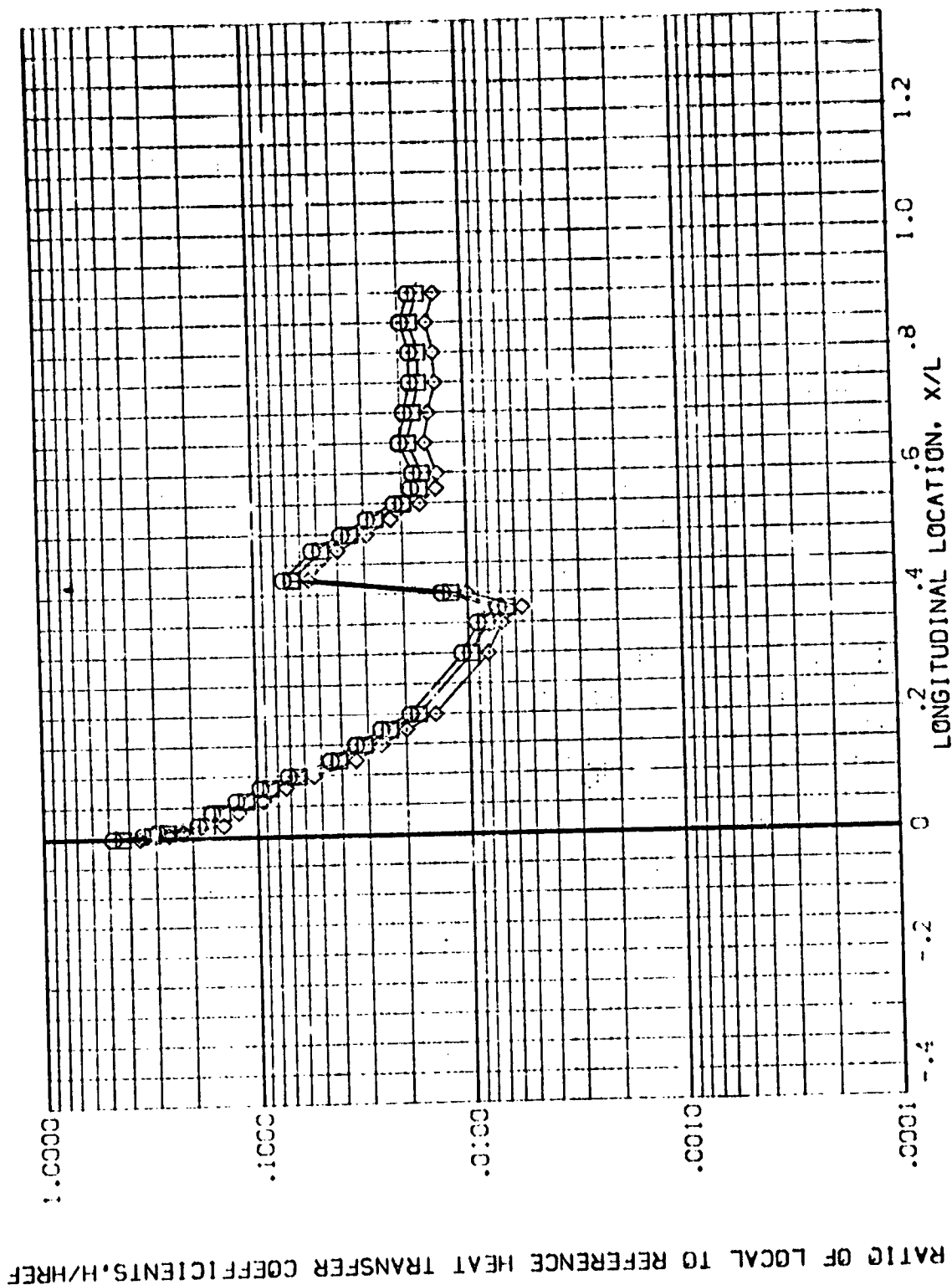
[illegible]

FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SWEEP-  
 .850  
 .300  
 1.000

PHI  
 90.000

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

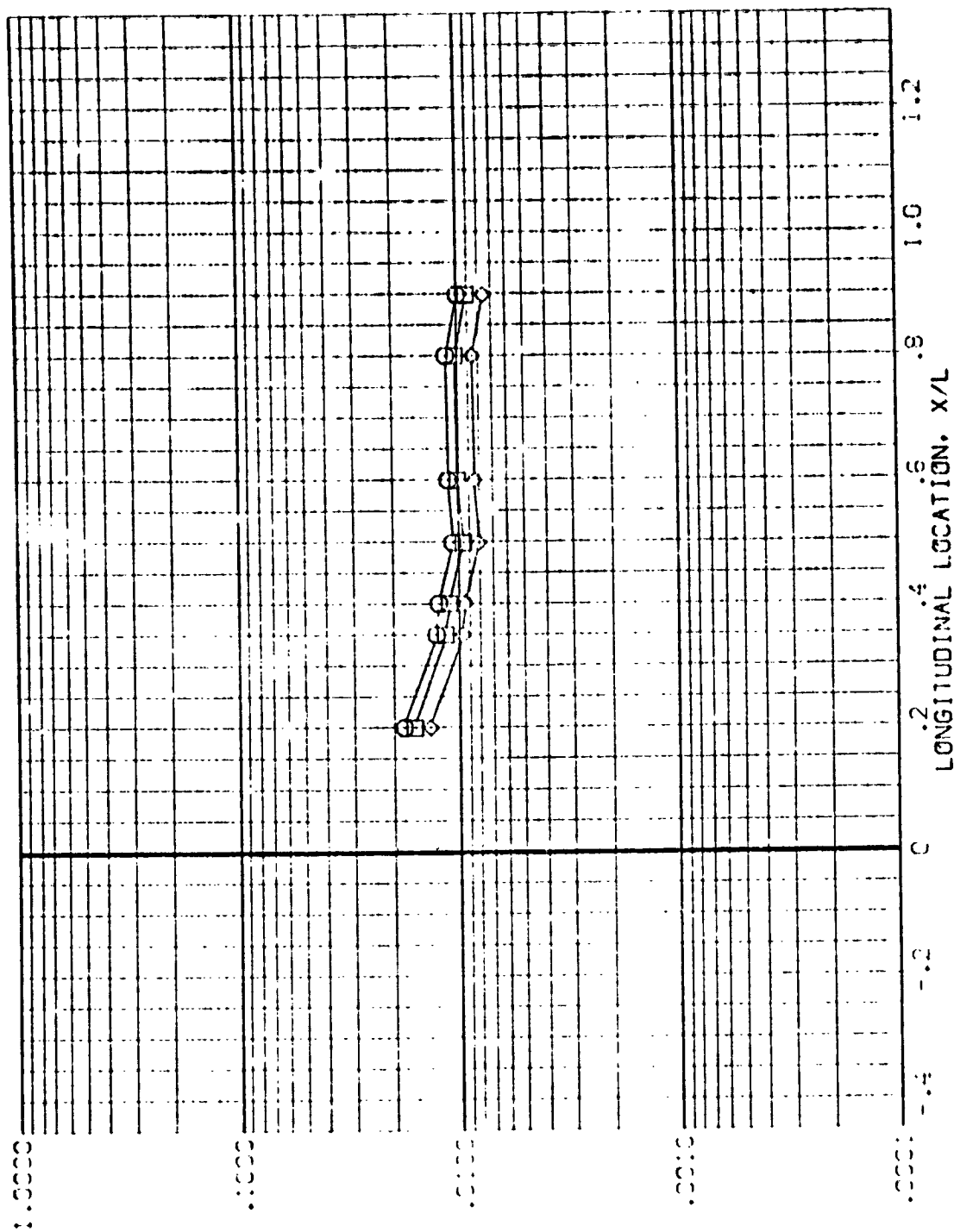


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01+11 EXTERNAL TANK

(REV102)

Q110

WATER/HR 5.1  
 1.350 112.500 5.223  
 1.300  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

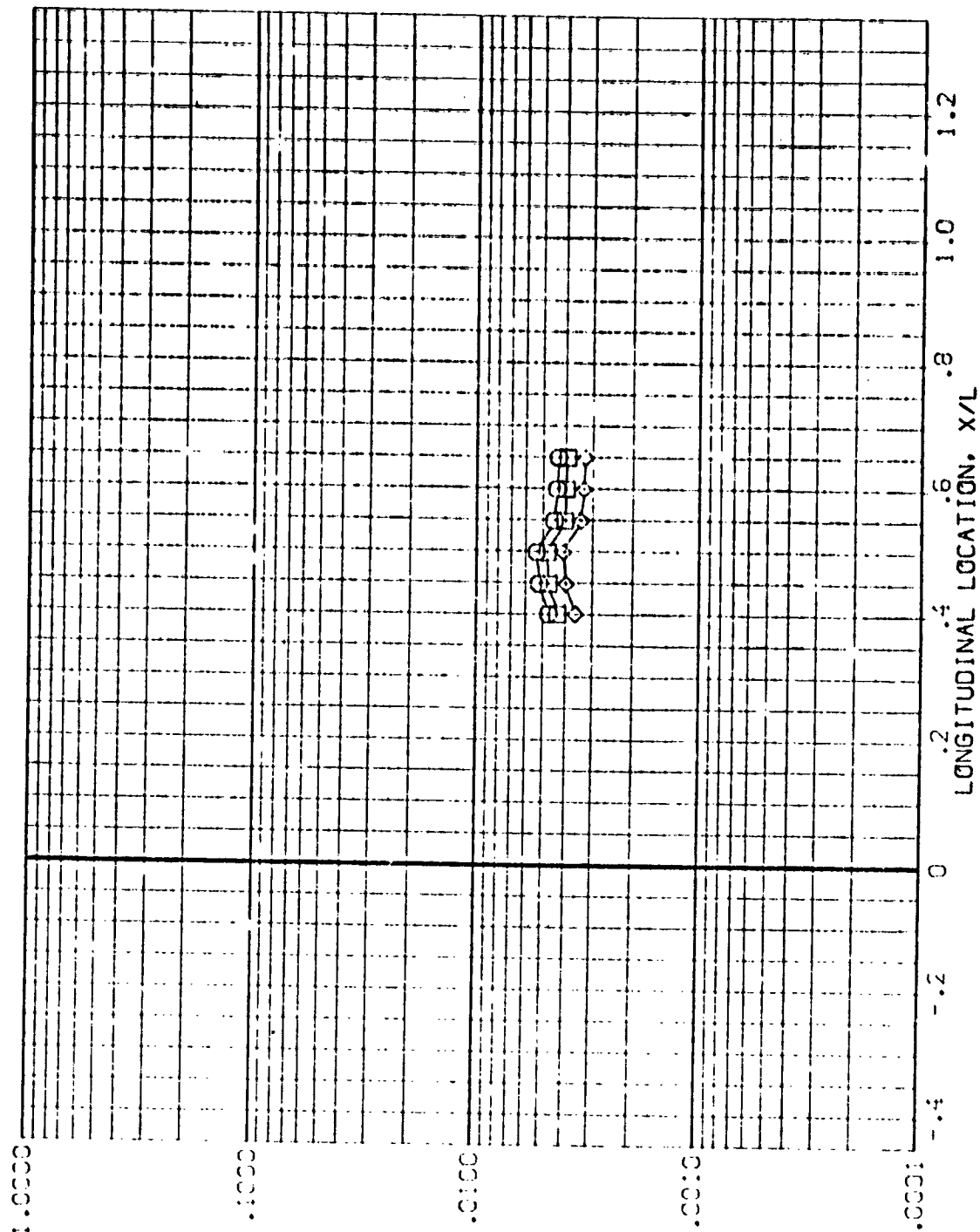


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

Q110

WALL/WT  
1.850  
1.900  
1.000

PHI  
135.000

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RN/L

BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

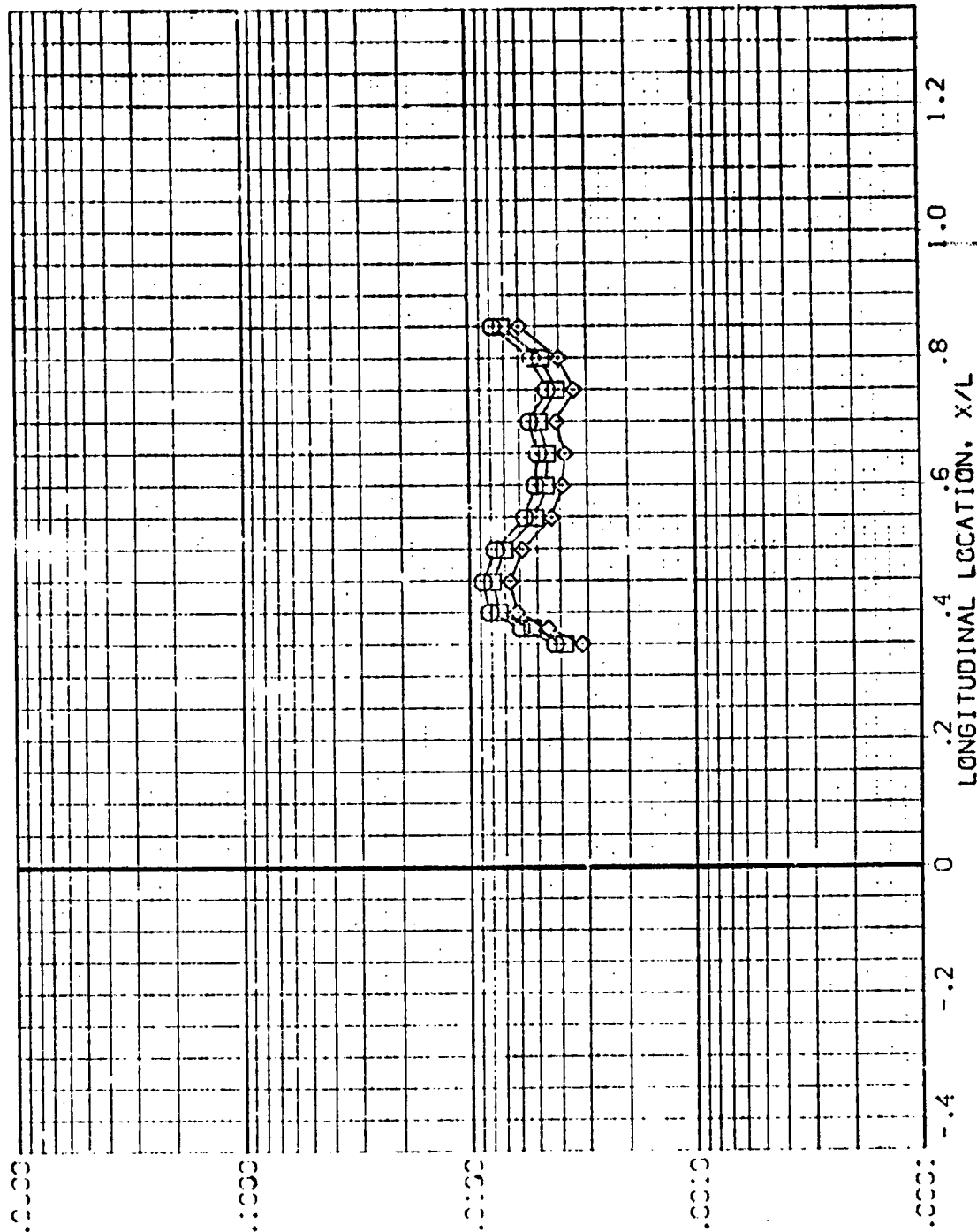


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T02)

SYMBOL	HAW/HT	PM	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
□	.850	157.500	5.220	30.000	.000
◇	.900			1.000	
◇	1.000				

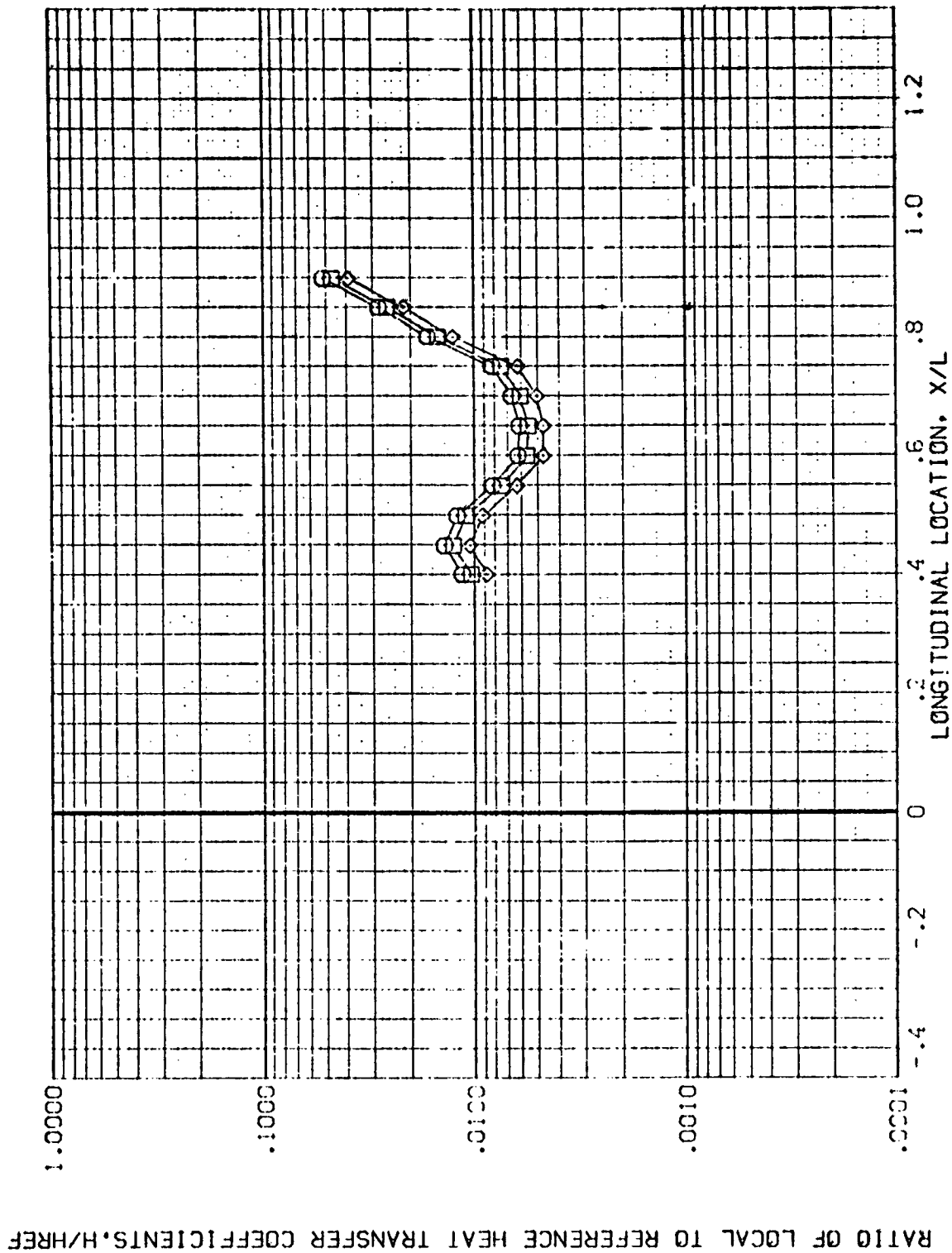


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV T02)

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 RN/L .000

SYMBOL H/W/H<sup>2</sup> P-1 MACH  
 .850 .80.000 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

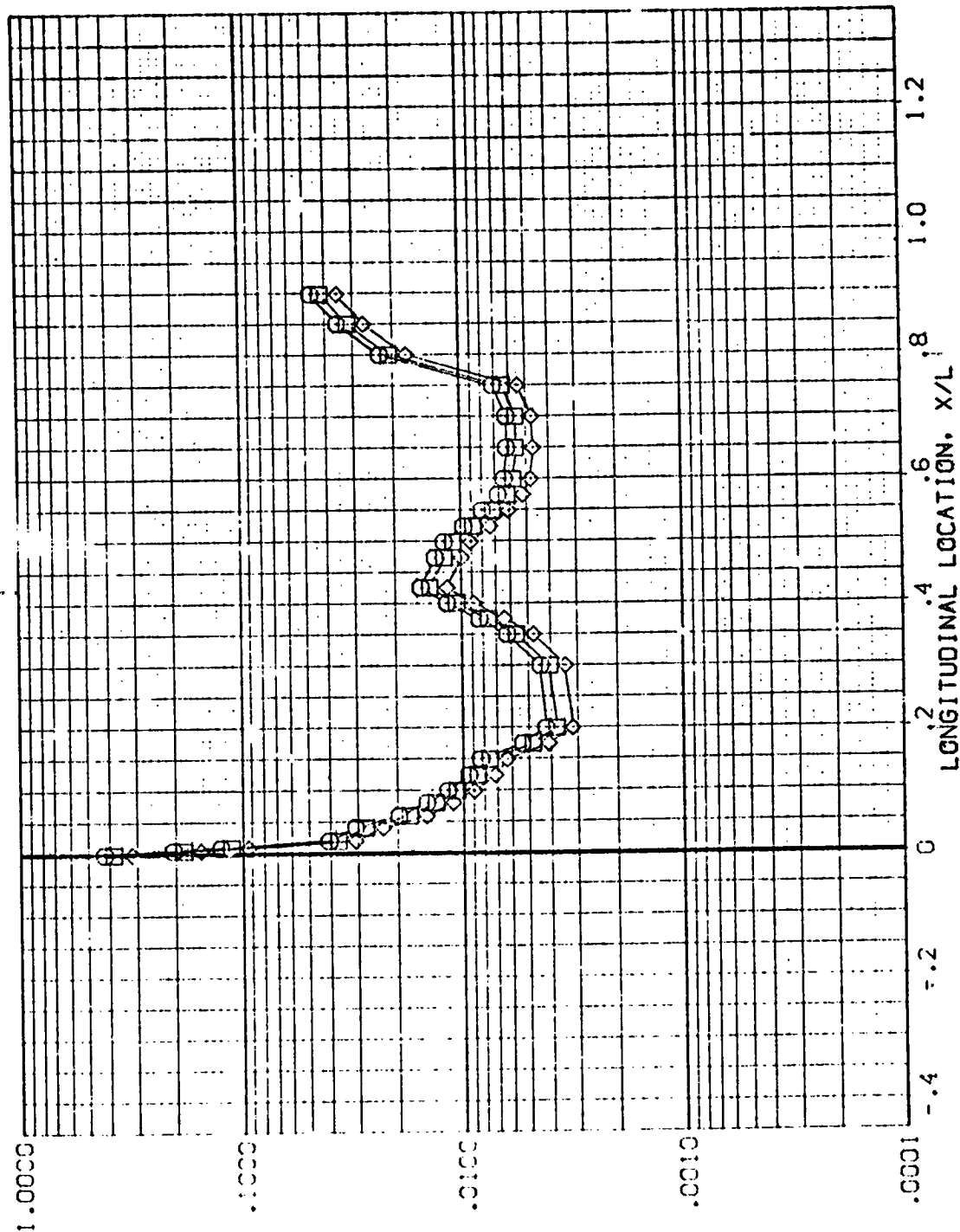


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AYES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T03)

SYMBOL HAW/H<sup>2</sup> PH: MACH  
 ◇ .850 90.000 5.220  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 60.000 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

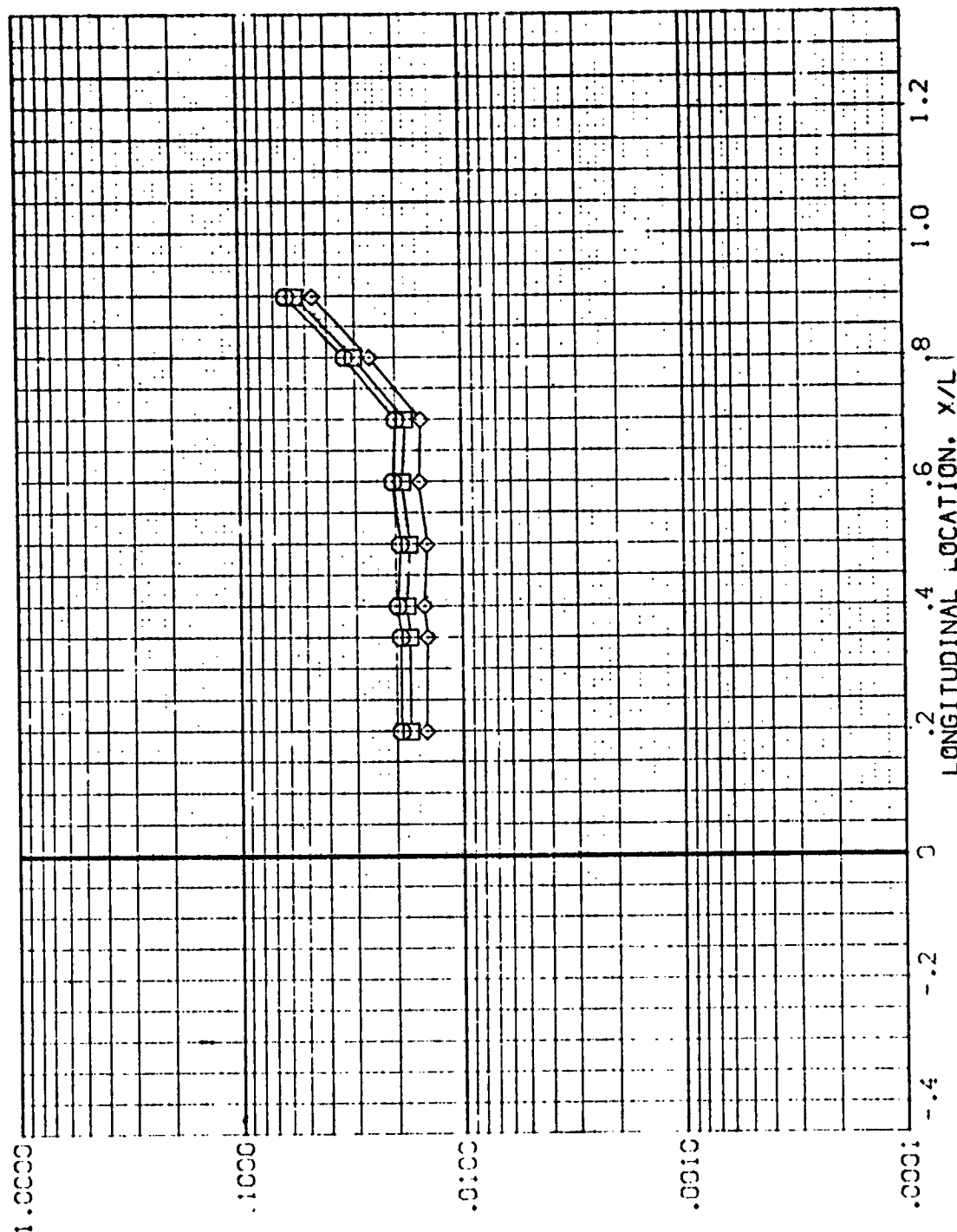


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



SVSEC  
OITD

WING/HT  
.950  
.920  
1.000

P-I  
112.500

MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
RN/L  
60.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

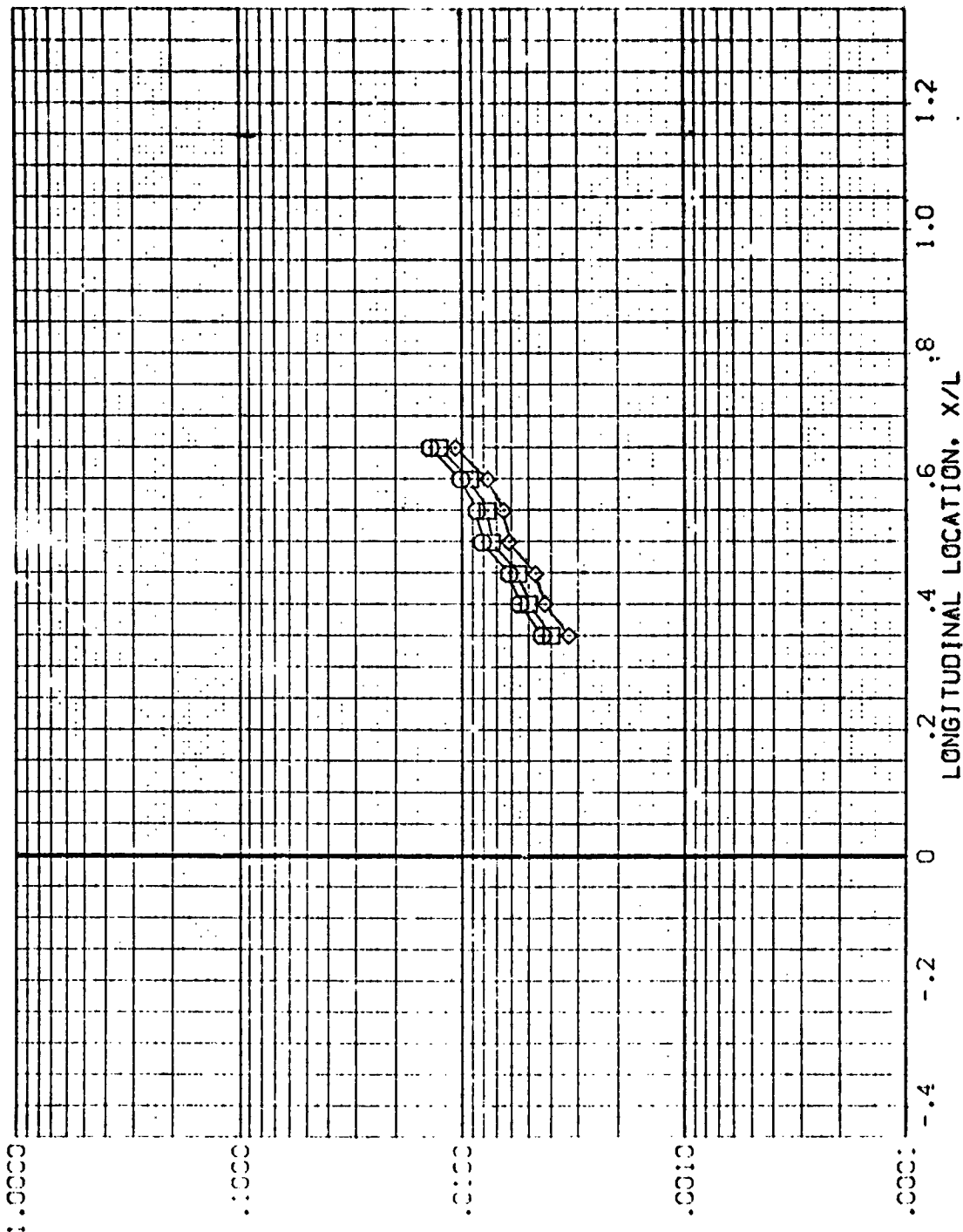


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01:11 EXTERNAL TANK

(REV T03)

SV222- WAVE/RT P=1 WACH  
 .850 135.000 5.220  
 .930  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

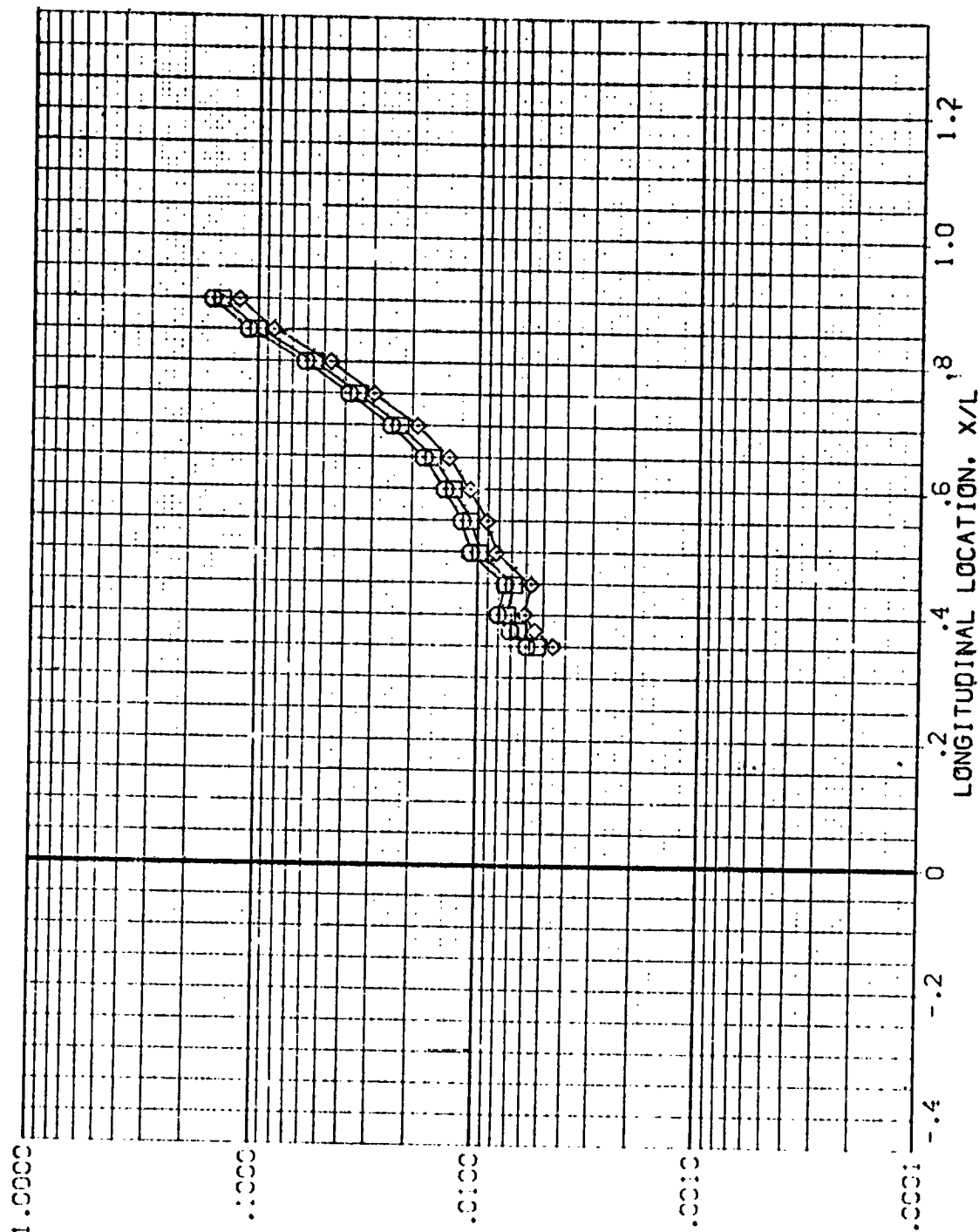


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYNCH  
□  
◇

HAB/HT PH: MACH  
.850 :57.500 5.220  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 60.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

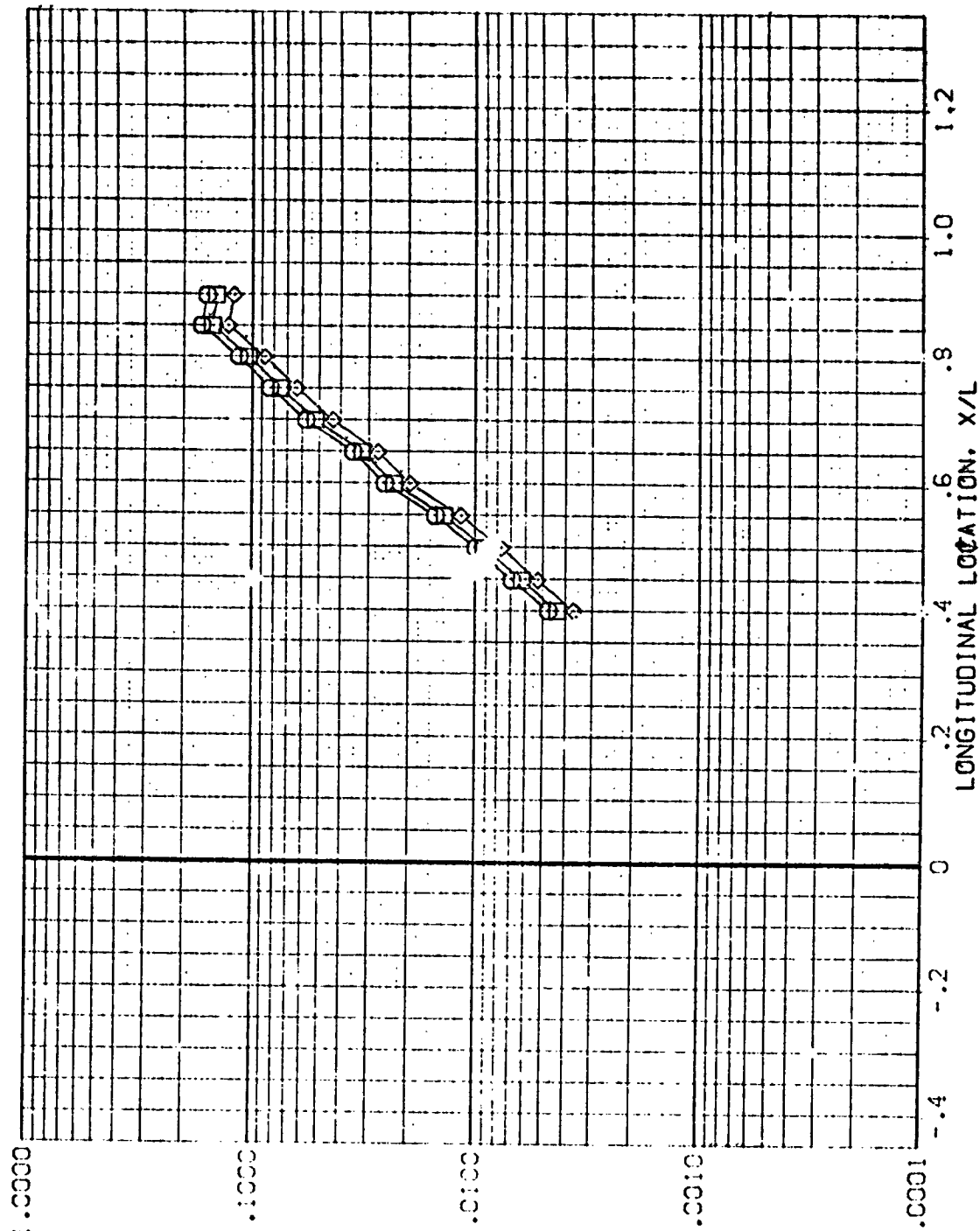


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T03)

SYSC	HA/HT	PHI	WACH	PARAMETRIC VALUES
◇	.850	180.000	5.220	ALPHA 60.000 BETA .000
	.900			RU/L 1.000
	1.000			

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

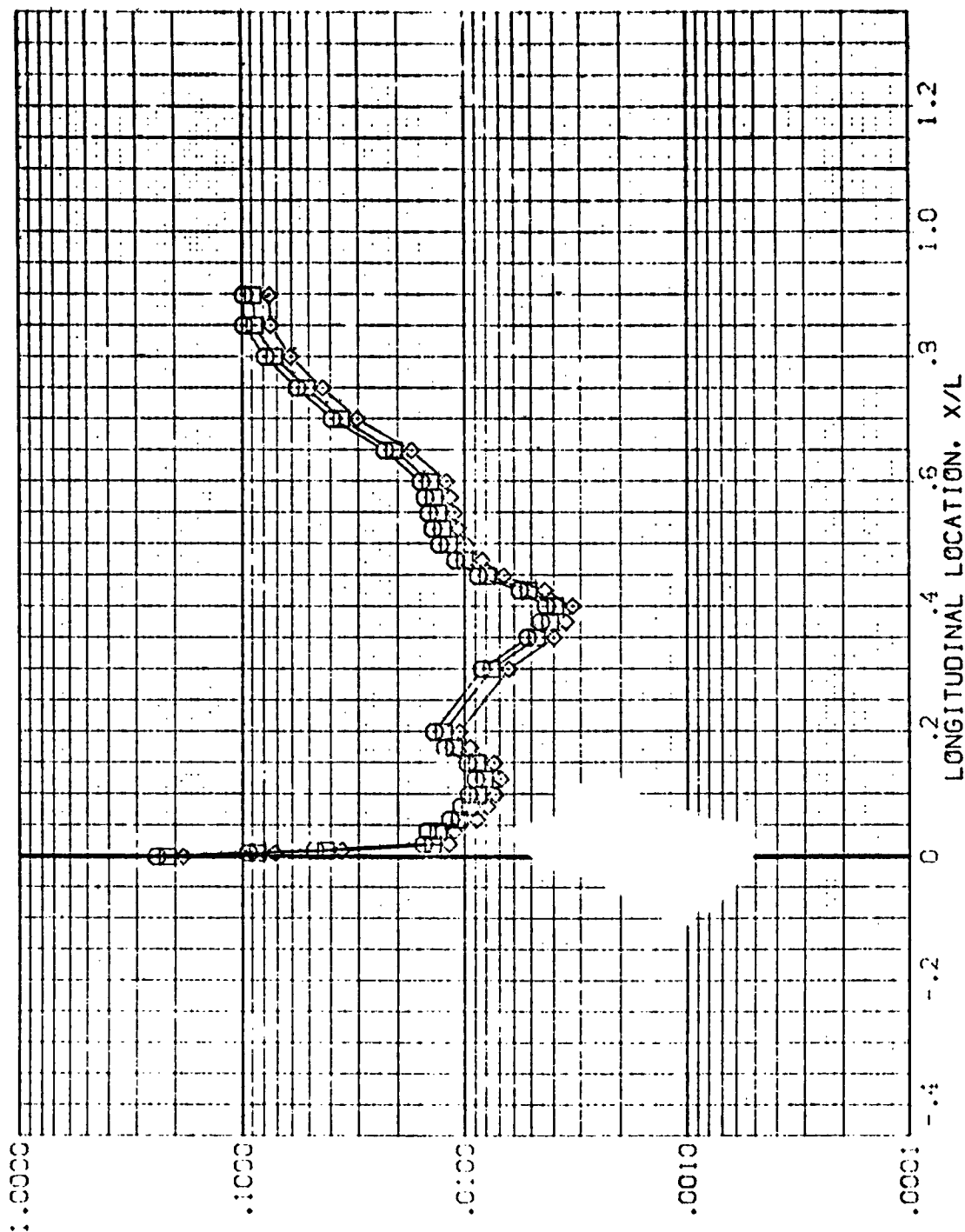


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T04)

SYMBOL  
 HAW/HT  
 .850  
 .900  
 1.000

PHI  
 90.000

MACH  
 5.221

PARAMETER VALUES  
 ALPHA  
 RN/L  
 90.000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

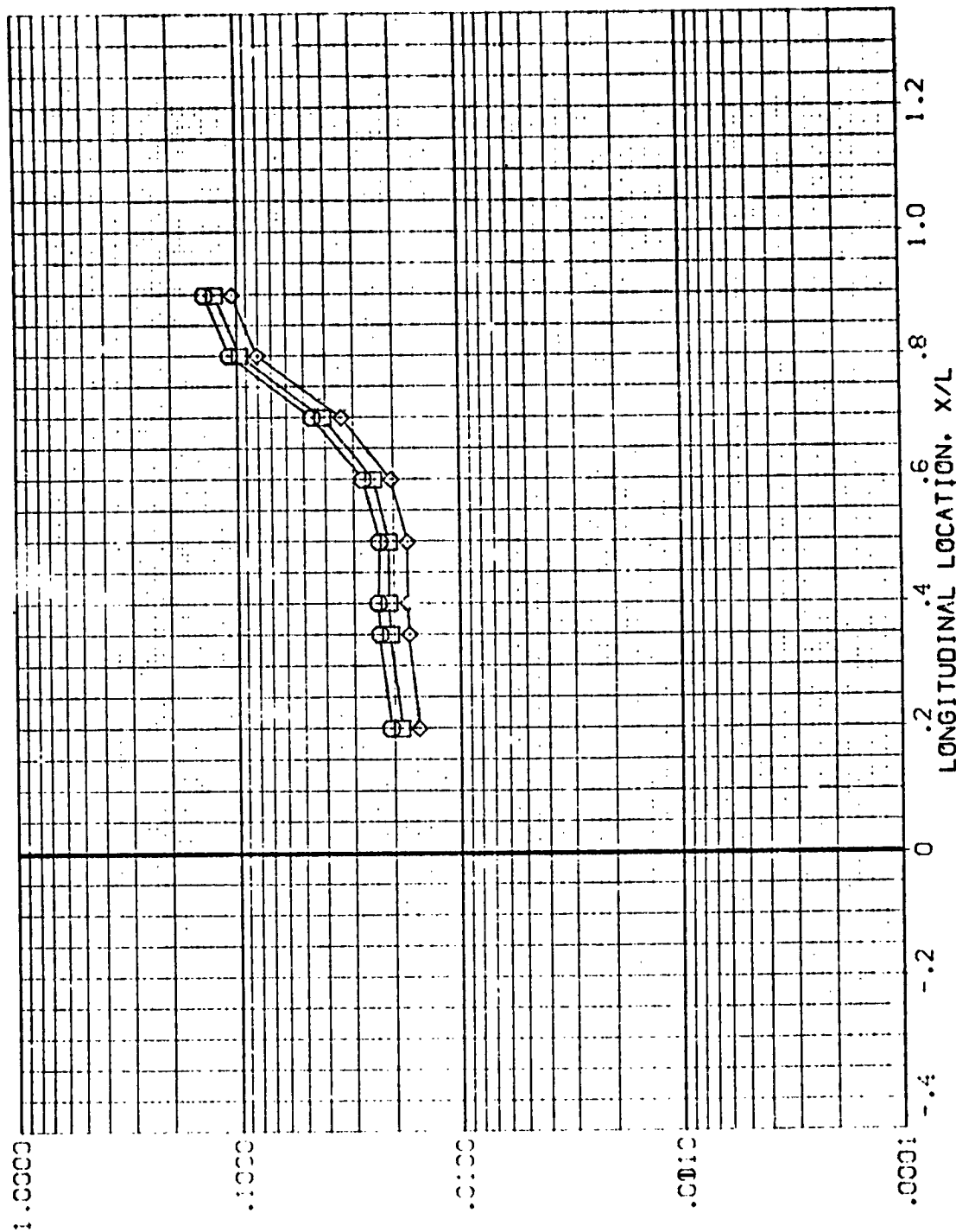


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T04)

PARAMETRIC VALUES  
 ALPHA 90.000 BETA .000  
 RV/L .000

SYNTHESIS  
 HAW/H-7  
 .850  
 .200  
 1.000  
 P-1  
 1:2.500  
 MACH  
 5.221

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

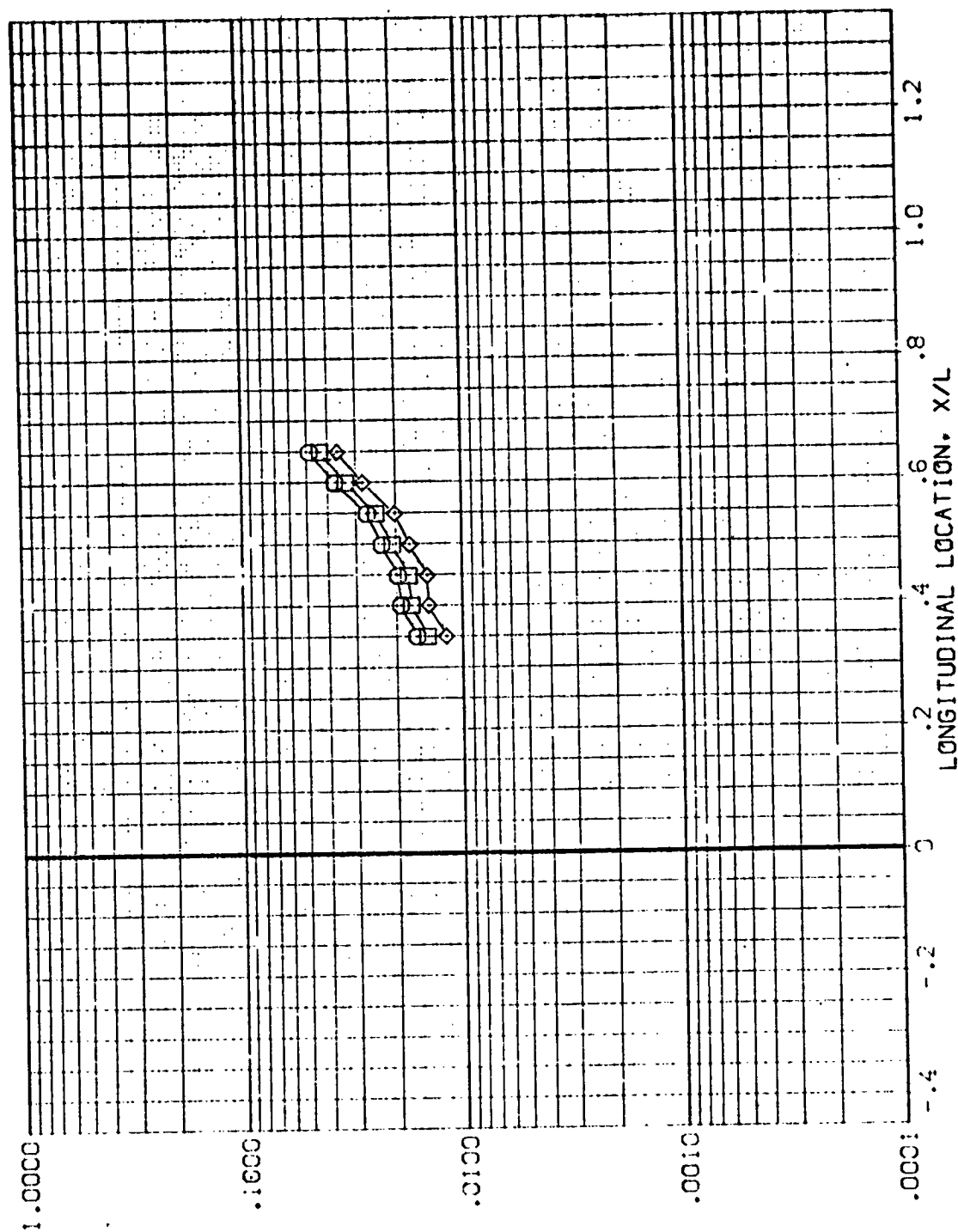


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV104)

SYMBOL

HAZ/H<sup>2</sup>

PR

MACH

1.550

1.95.000

5.221

1.000

PARAMETRIC VALUES

ALPHA

RN/L

93.000

1.000

BETA

.0000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

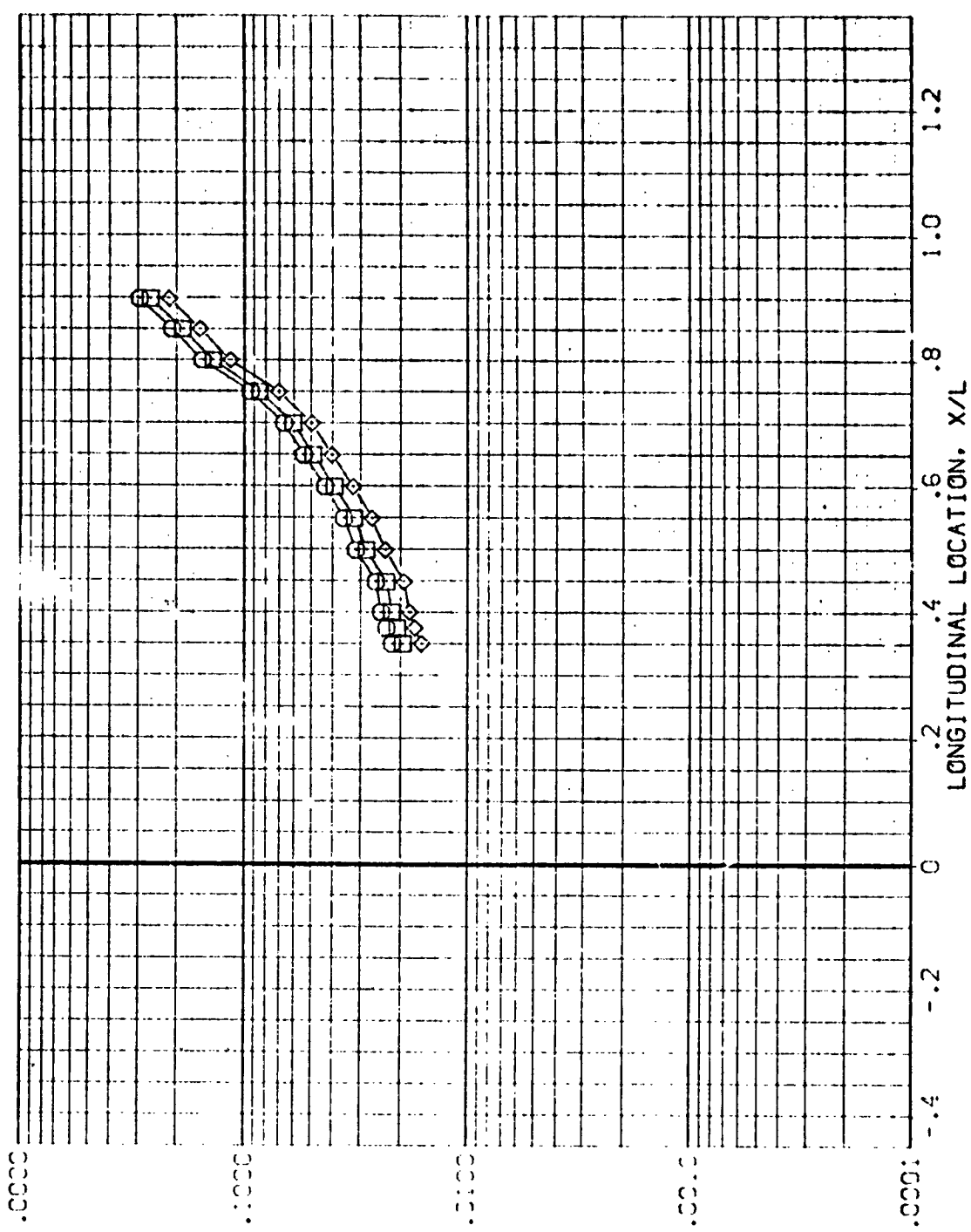


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-1.95 IH28 01+T1 EXTERNAL TANK

(REVTO4)

SYMBOL	WAVELENGTH	CH	MACH	PARAMETRIC VALUES
◇	.850	157.500	5.221	ALPHA 90.000 BETA .000
□	.900			PR/L 1.000
◇	1.000			

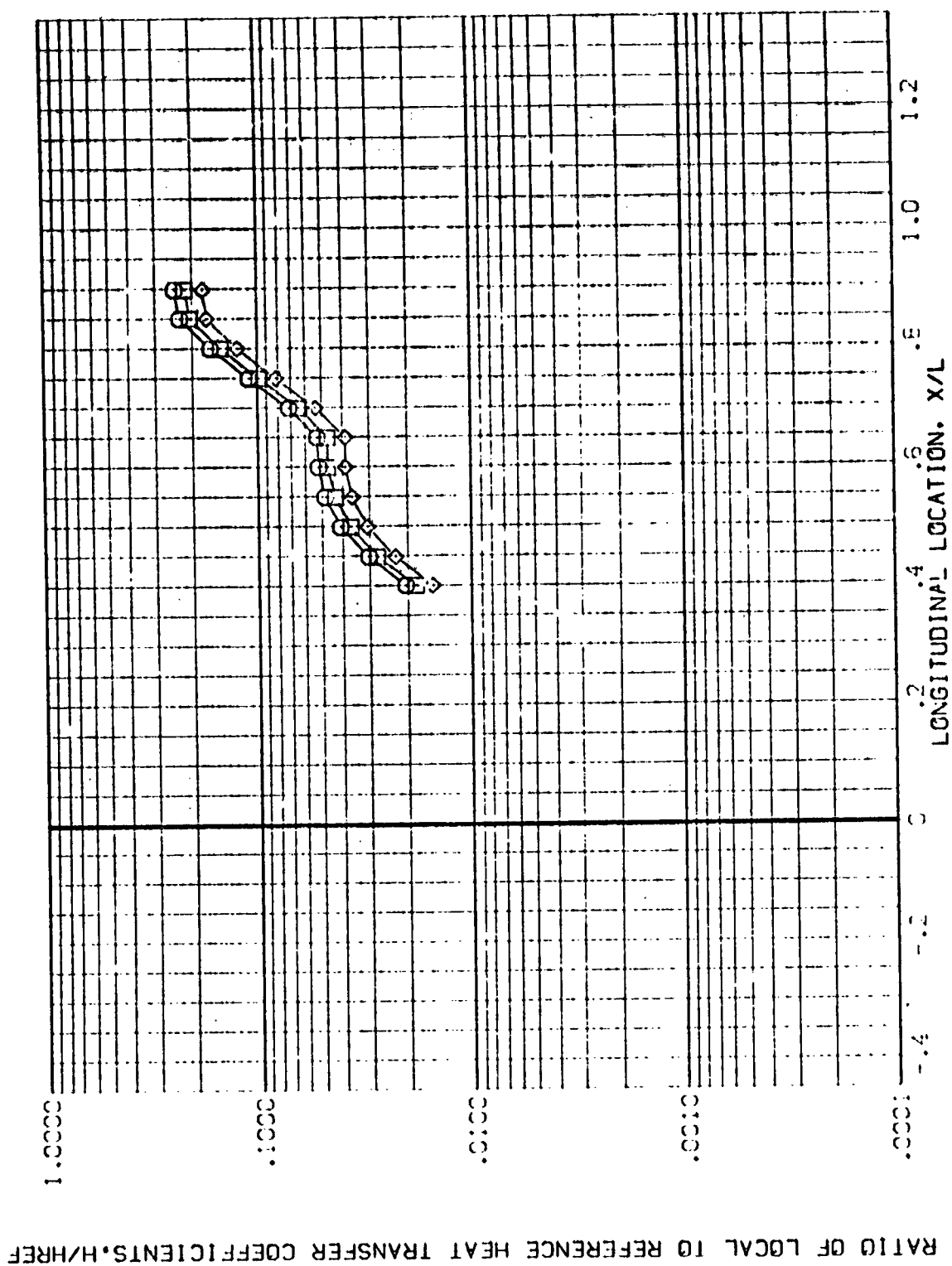


FIG. 5 TANK IN THE PRESENCE OF ORBITER



AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REF TO 4)

SYMBOL

MASS/F<sup>2</sup> PHI MACH  
 .850 180.000 5.221  
 .900  
 1.000

PARAMETER VALUES

ALPHA 90.000 BETA 1.000  
 PHI 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, HZ/REF

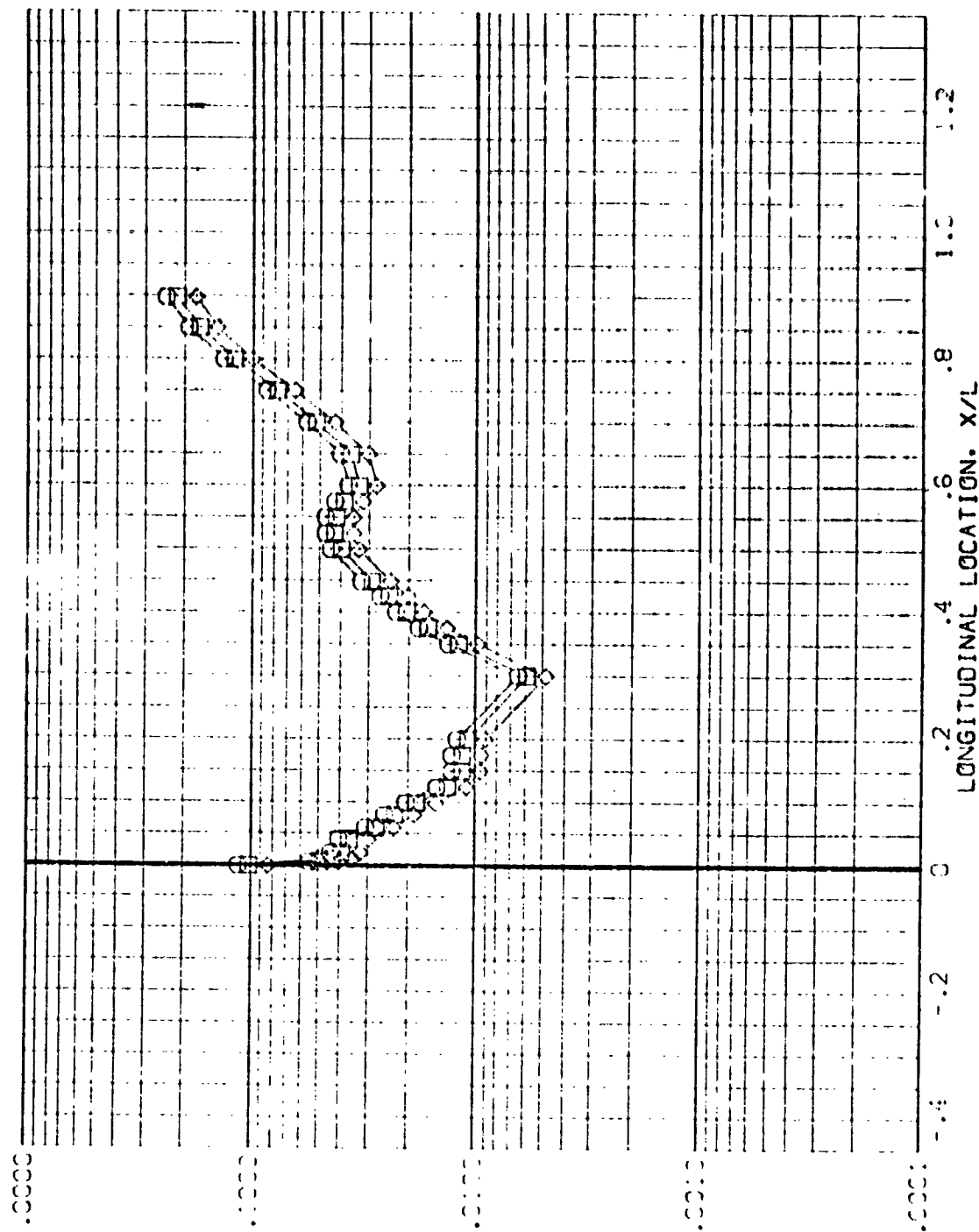


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AMES RESEARCH CENTER, AMES, CALIF. 94002

REPORT NO. 70-100

1964-050

PARAMETRIC VALUES  
ALPHA 100.000 BETA .000  
SVL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

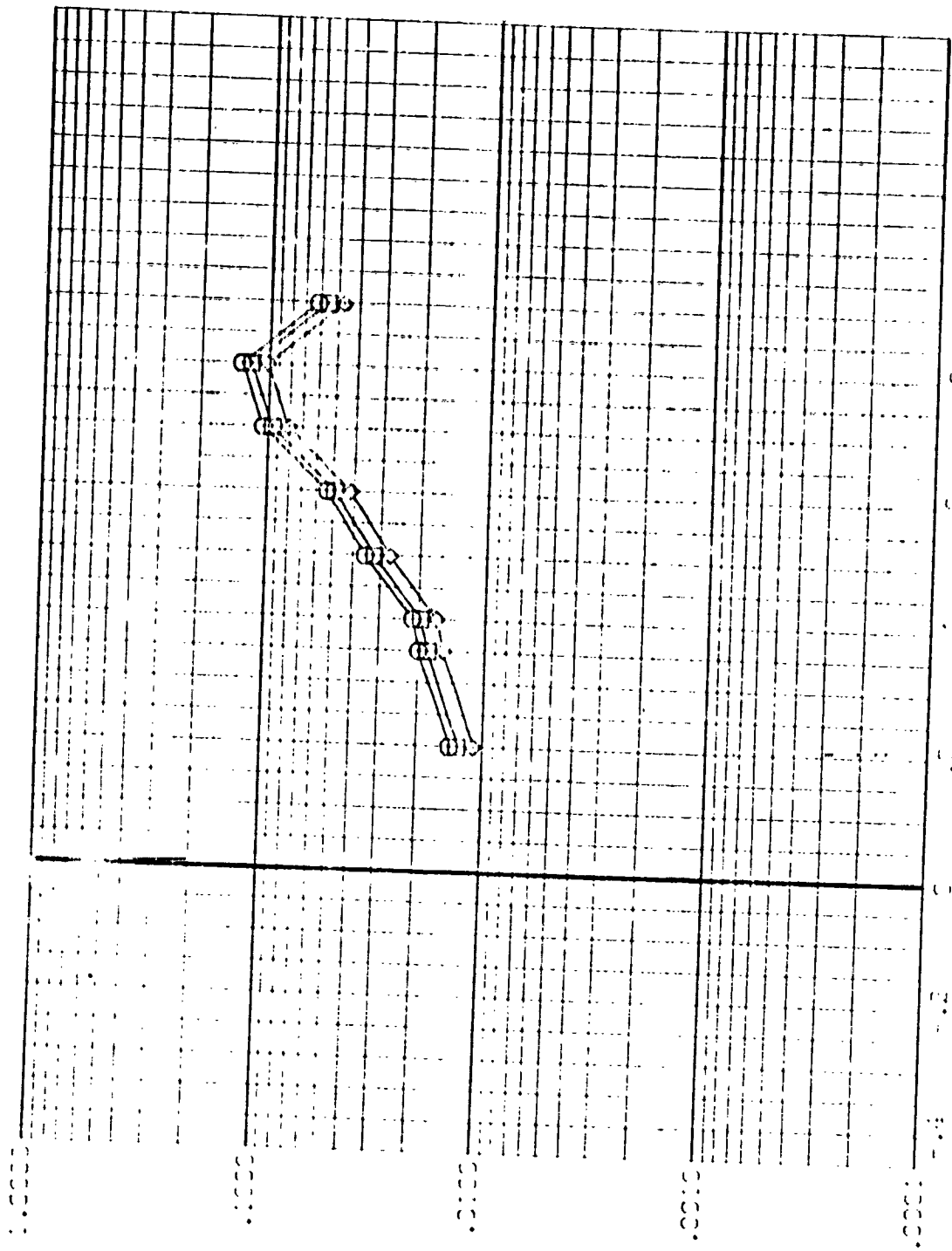


FIG. 5 TANK IN THE PRESENCE OF ORBITER

SAVEC  
 0.170

WAVE/WT PWT MACH  
 .850 112.500 5.221  
 .900  
 1.000

PARAMETER VALUES  
 ALPHA 120.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

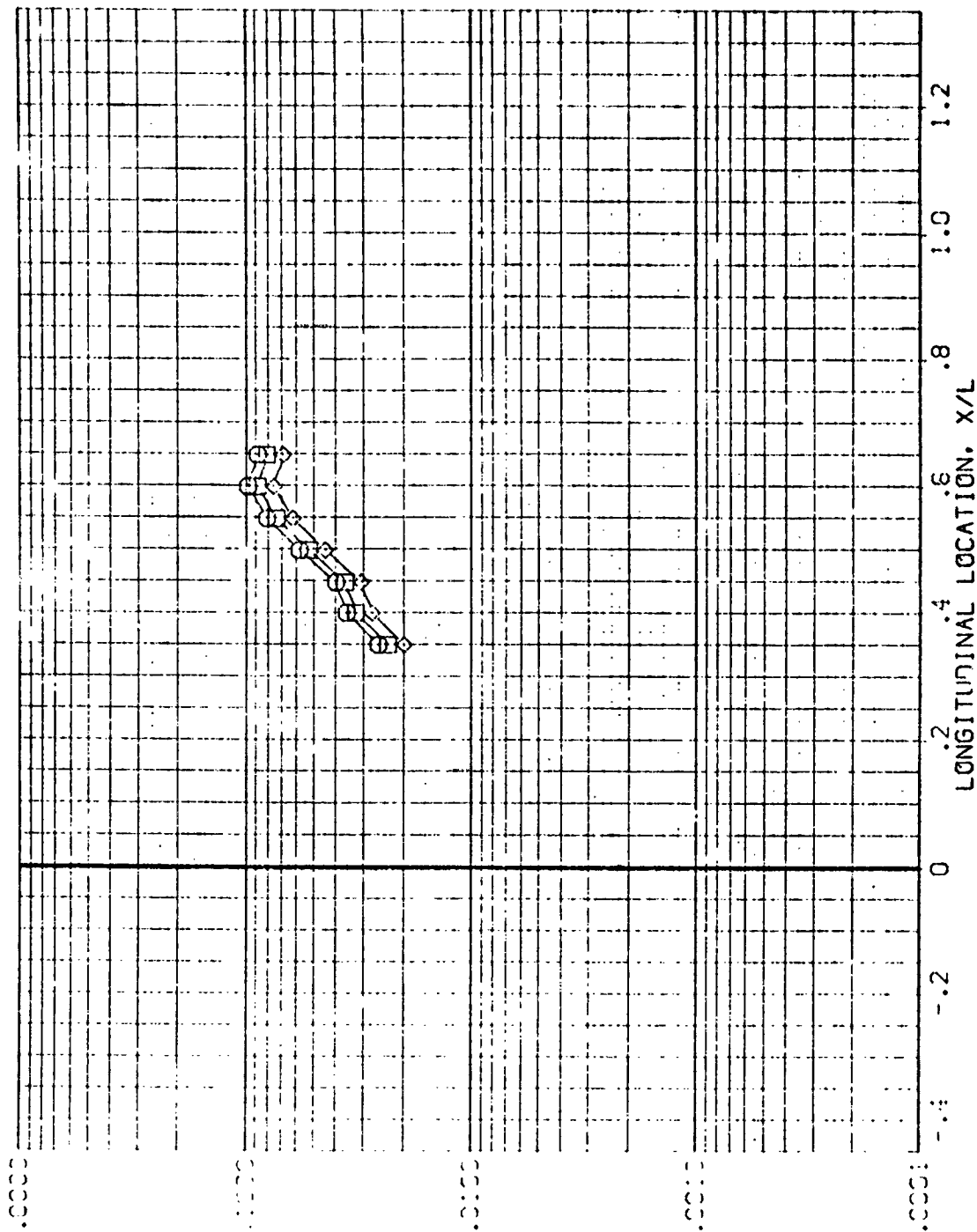


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+T1 EXTERNAL TAN:

(REV T05)

SYMBOL H<sub>0</sub>/H<sub>∞</sub> P-1 MACH  
 □ .850 135.000 5.22:  
 ◇ .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

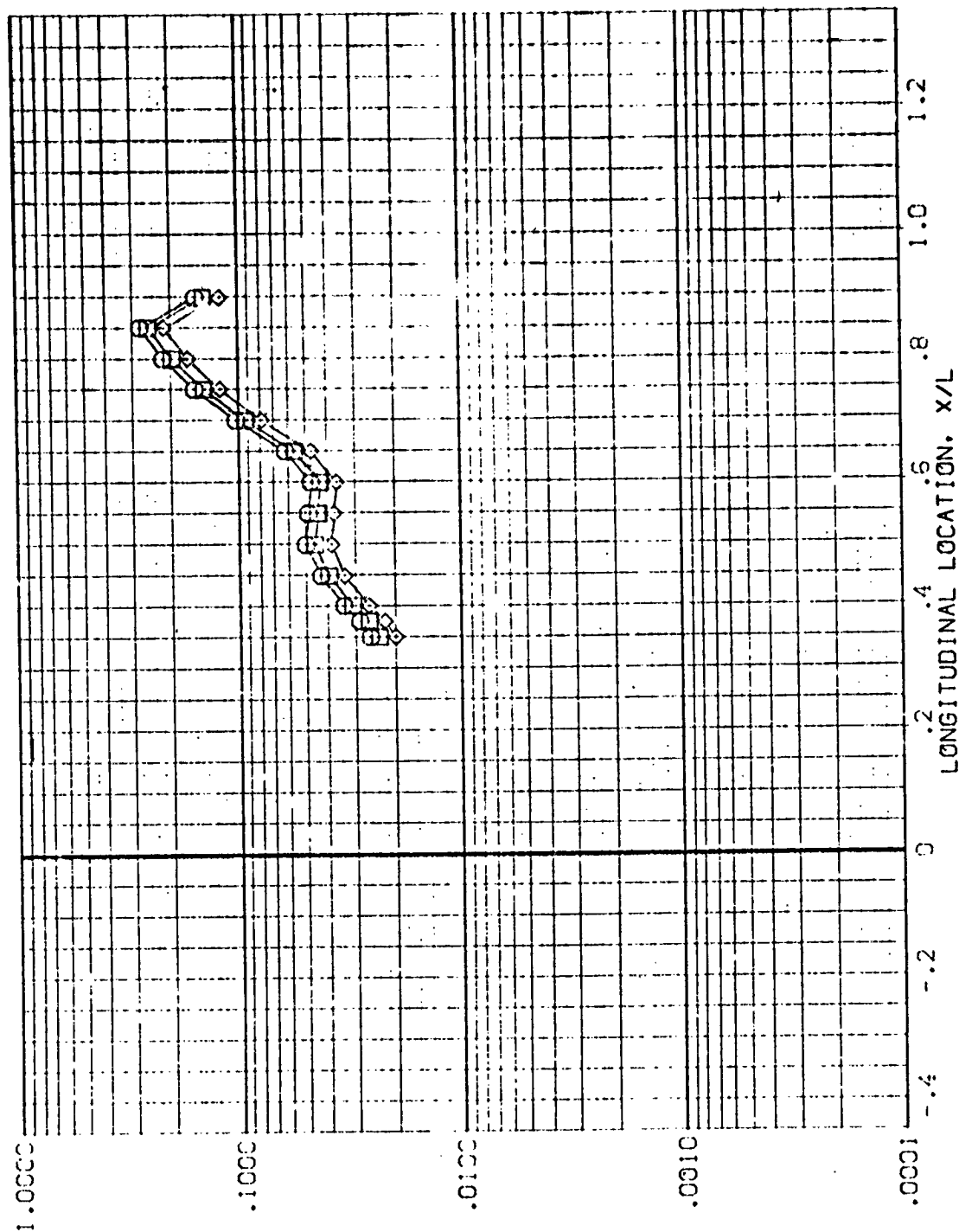


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

PARAMETER VALUES  
ALPHA 120.000  
BETA .000

SYMBOL HAW/HT PH: MACH  
□ .850 157.500 5.221  
◇ .900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

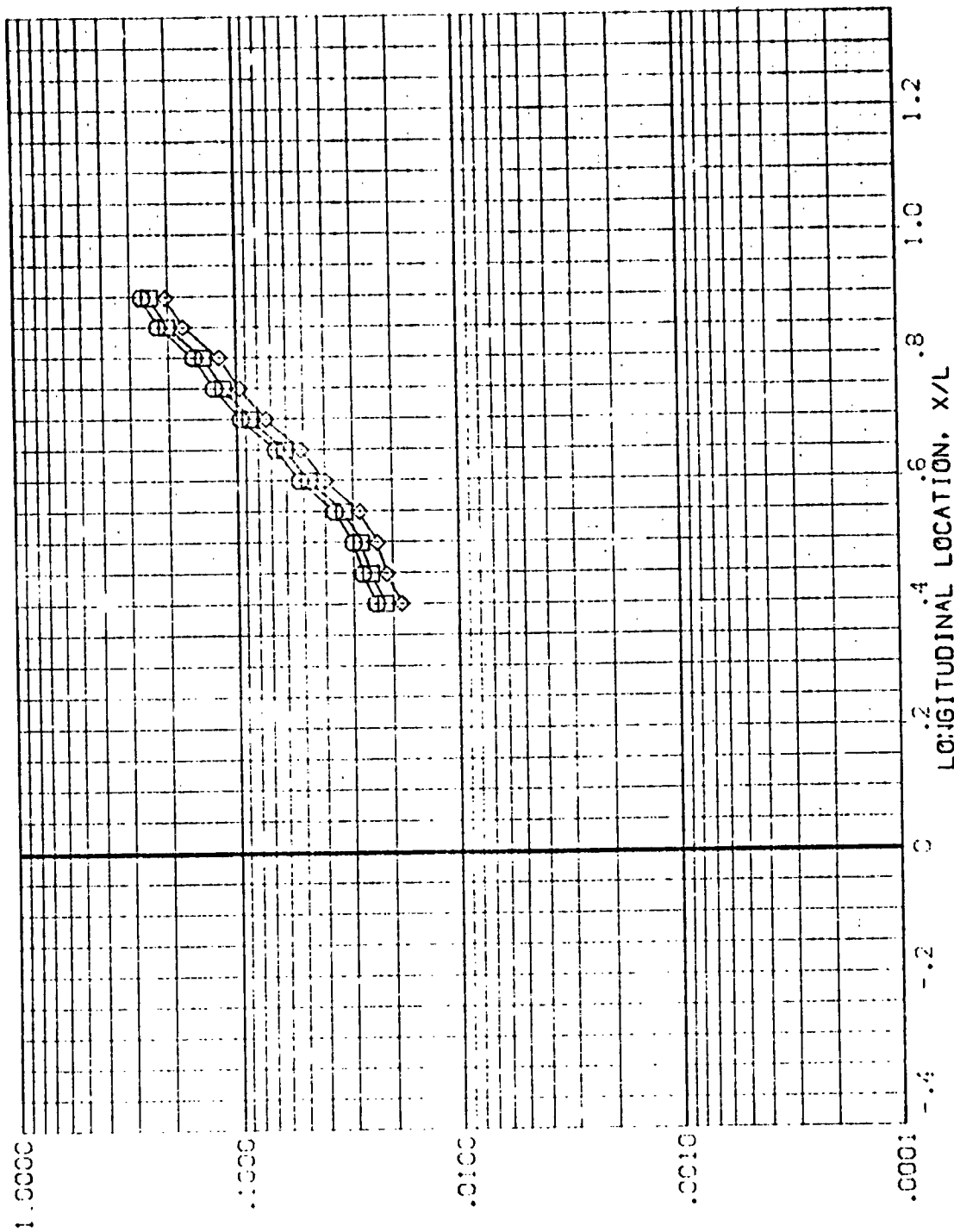


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01-11 EXTERNAL TANK

(REV T05)

SI-VECT- HAW/HT P-1: MACH  
 .250 :50.000 5.221  
 .500  
 1.000

PAR-METRIC VALUES  
 ALPHA 120.000 BETA .000  
 R<sub>1</sub>/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

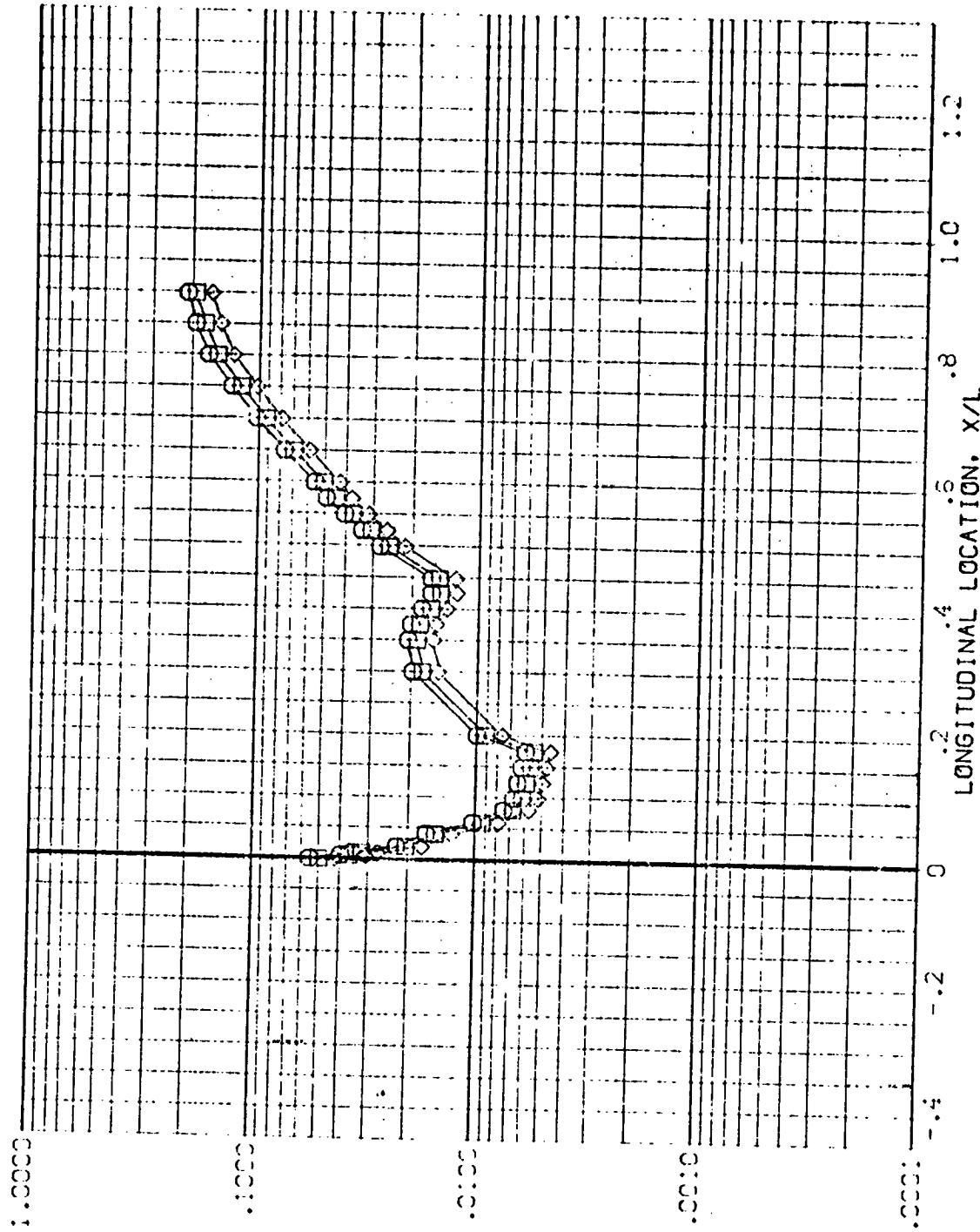


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYNOPSIS  
 1.000  
 .900  
 .800  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 .000

WIND VELOCITY  
 90.000  
 5.220

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA 1.000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, HZ/HREF

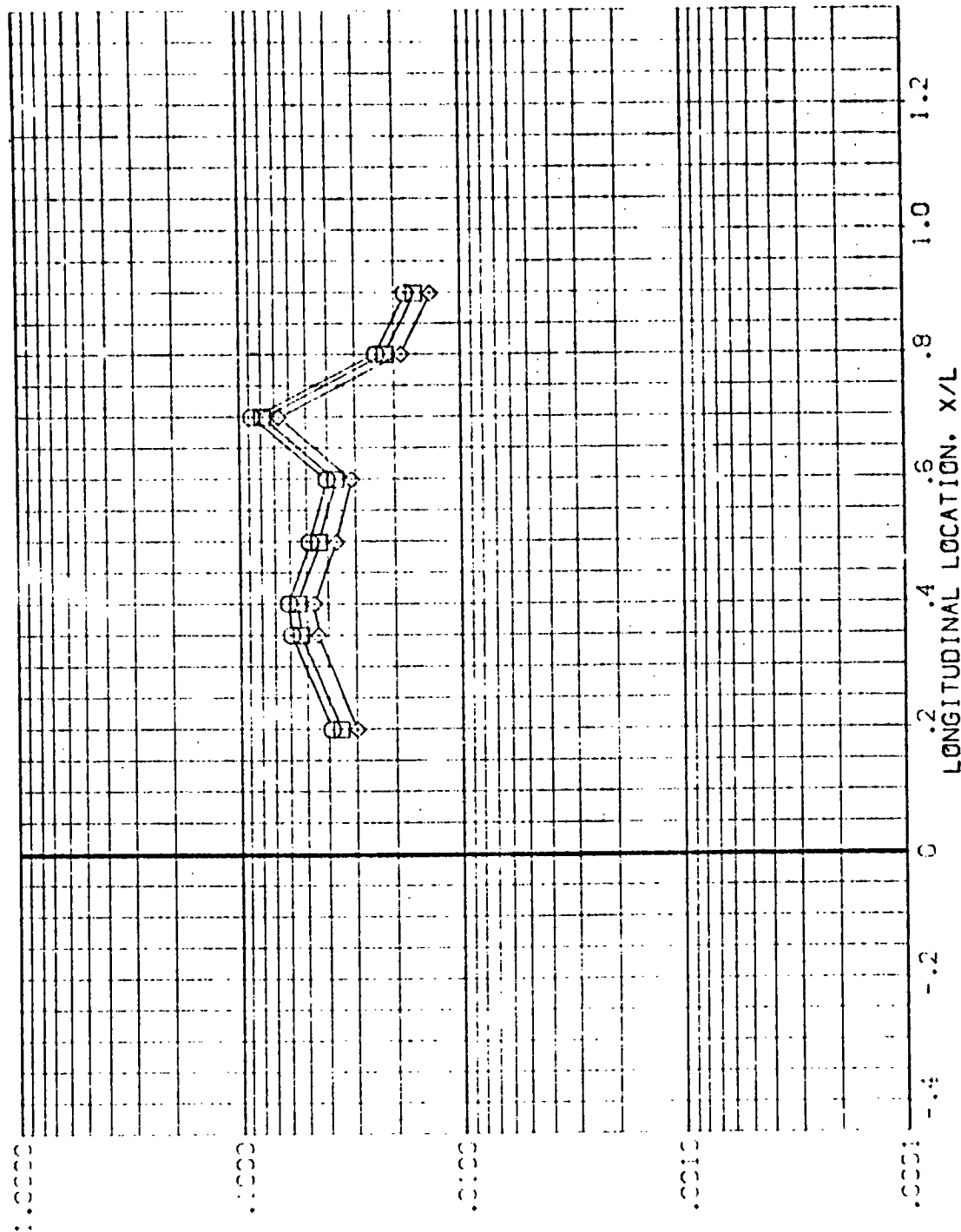


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-125 1428 01-T1 EXTERNAL TANK

(REV 06)

SAVES-  
110

WAVE-  
1.850  
1.250  
1.000  
1.000

BL-  
112.500  
WACH  
5.220

PARAMETRIC VALUES  
ALPHA  
RV/L  
-120.000  
1.000  
BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

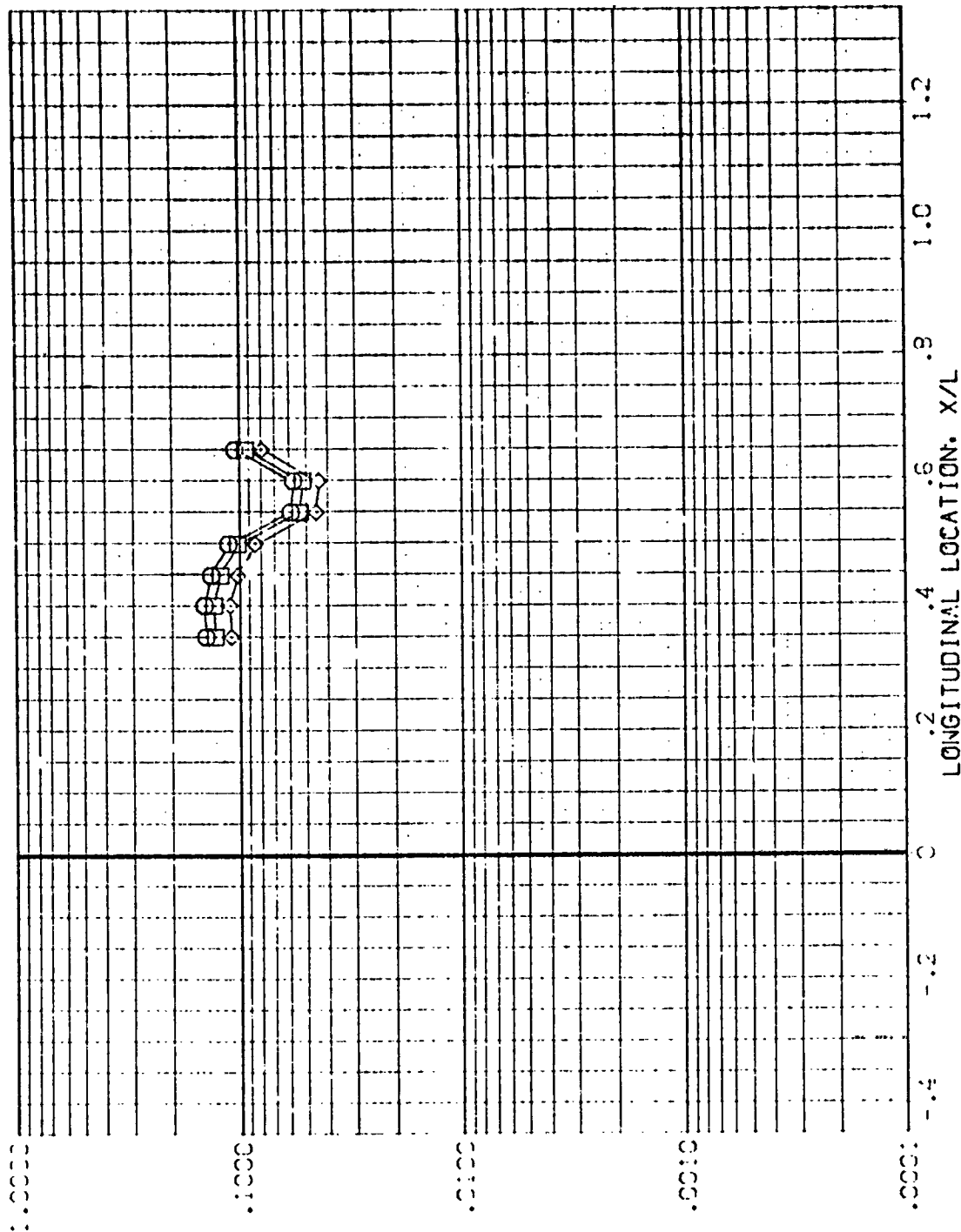


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AVES 3.5-195 IH28 01+T1 EXTERNAL TAN"

(REV106)

SYMBOL  
 ◇  
 ○  
 □  
 ▽

WAVE/WT  
 .850  
 .850  
 .850  
 1.000

PHI  
 135.000

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 PIV/L  
 -120.000  
 1.000

BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

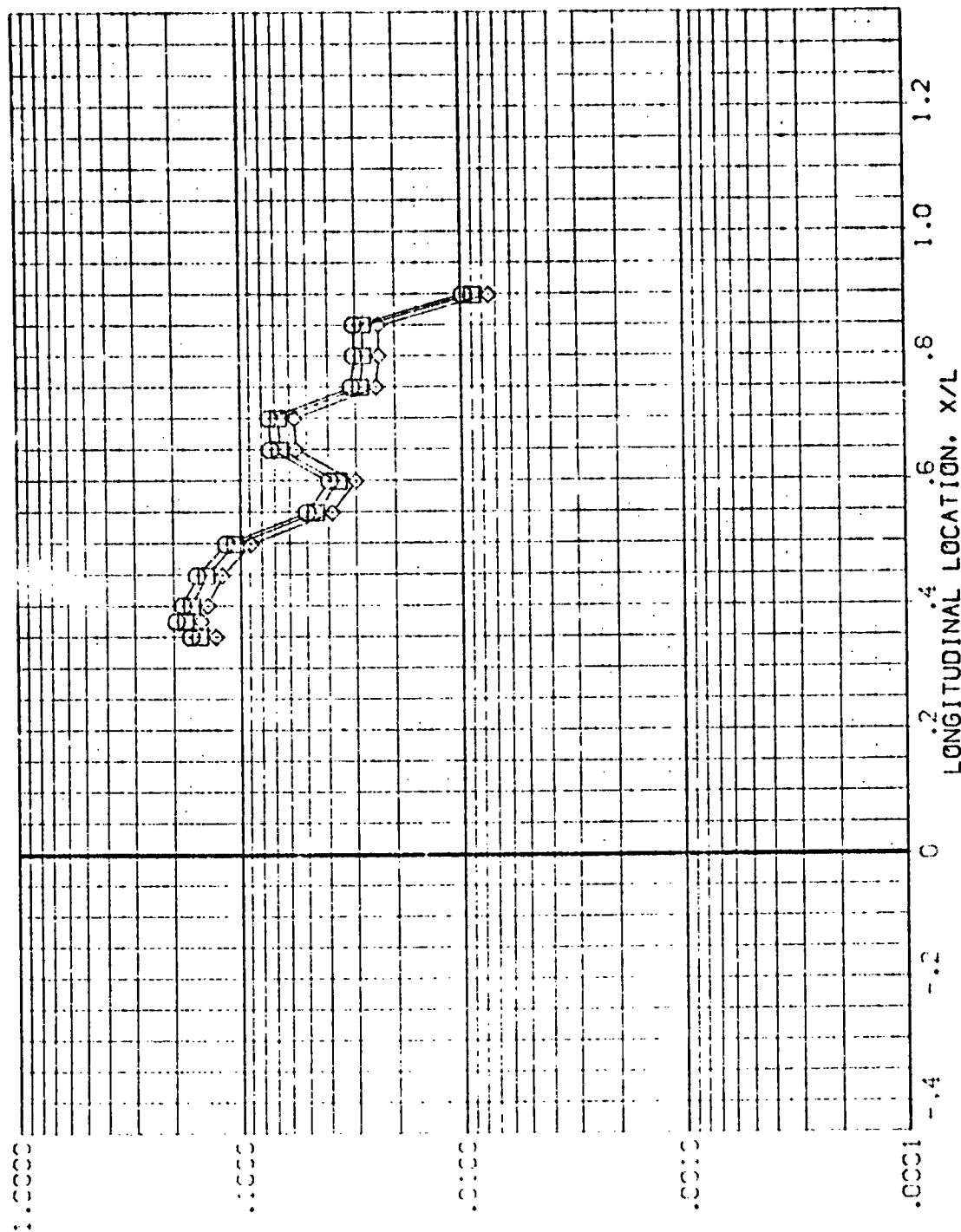


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 .P28 01+T1 EXTERNAL TANK

(REV 06)

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
PR/L .000

SYMBOLS  
◇ □  
H/W/LT .833  
P/L 157.500  
MACH 5.4220  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

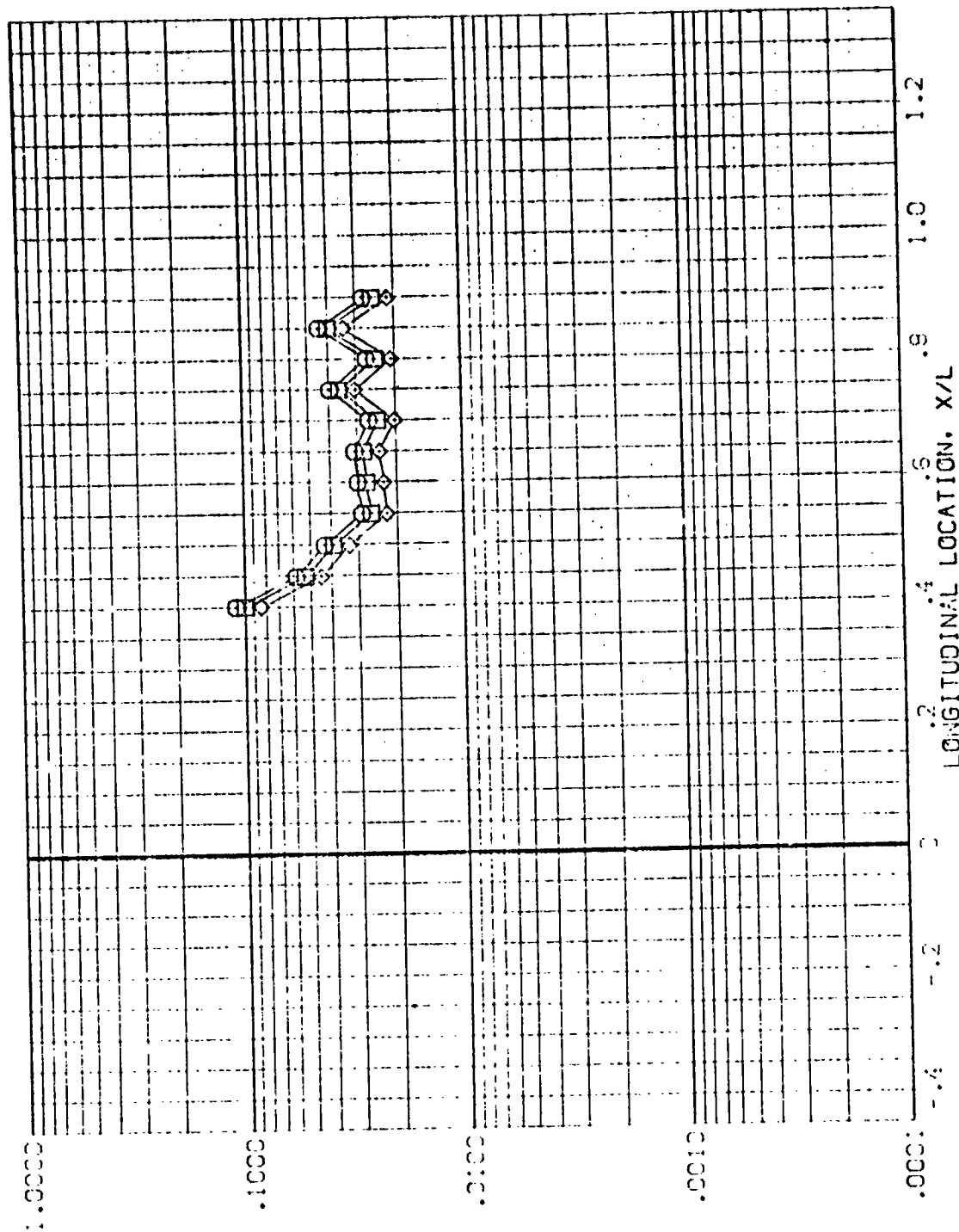


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1-428 C1+T1 EXTERNAL TANK

(REV T06)

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

SVRCS  
 WACH 100.000 5.020  
 WACH 100.000 5.020  
 WACH 100.000 5.020  
 WACH 100.000 5.020

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

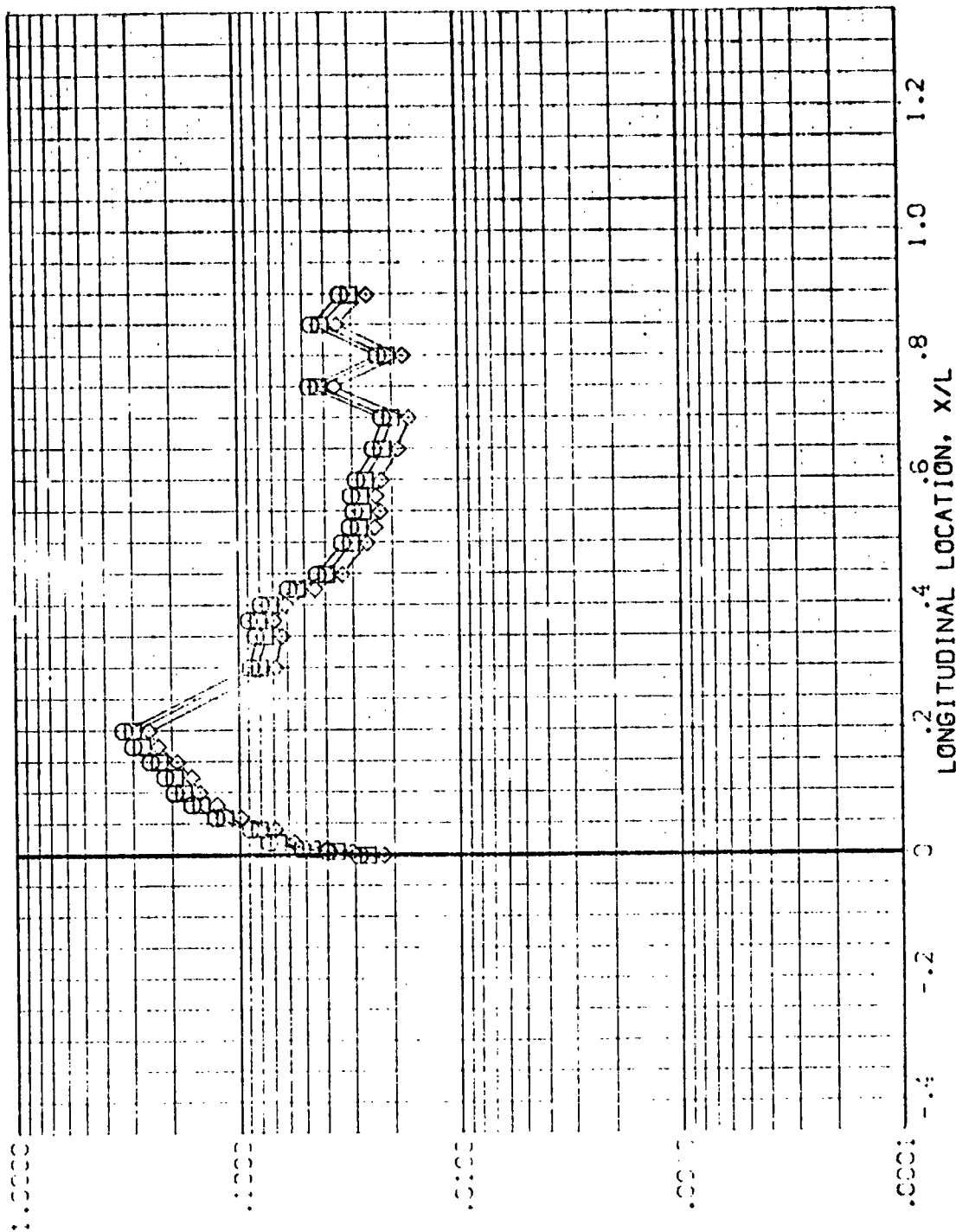


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV T07)

5-VEE  
 1.000  
 .300  
 .500  
 .800  
 1.000

PR-1  
 90.000  
 MACH  
 5.019

PARAMETRIC VALUES  
 ALPHA  
 PR/L 1.000  
 BETA  
 -90.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

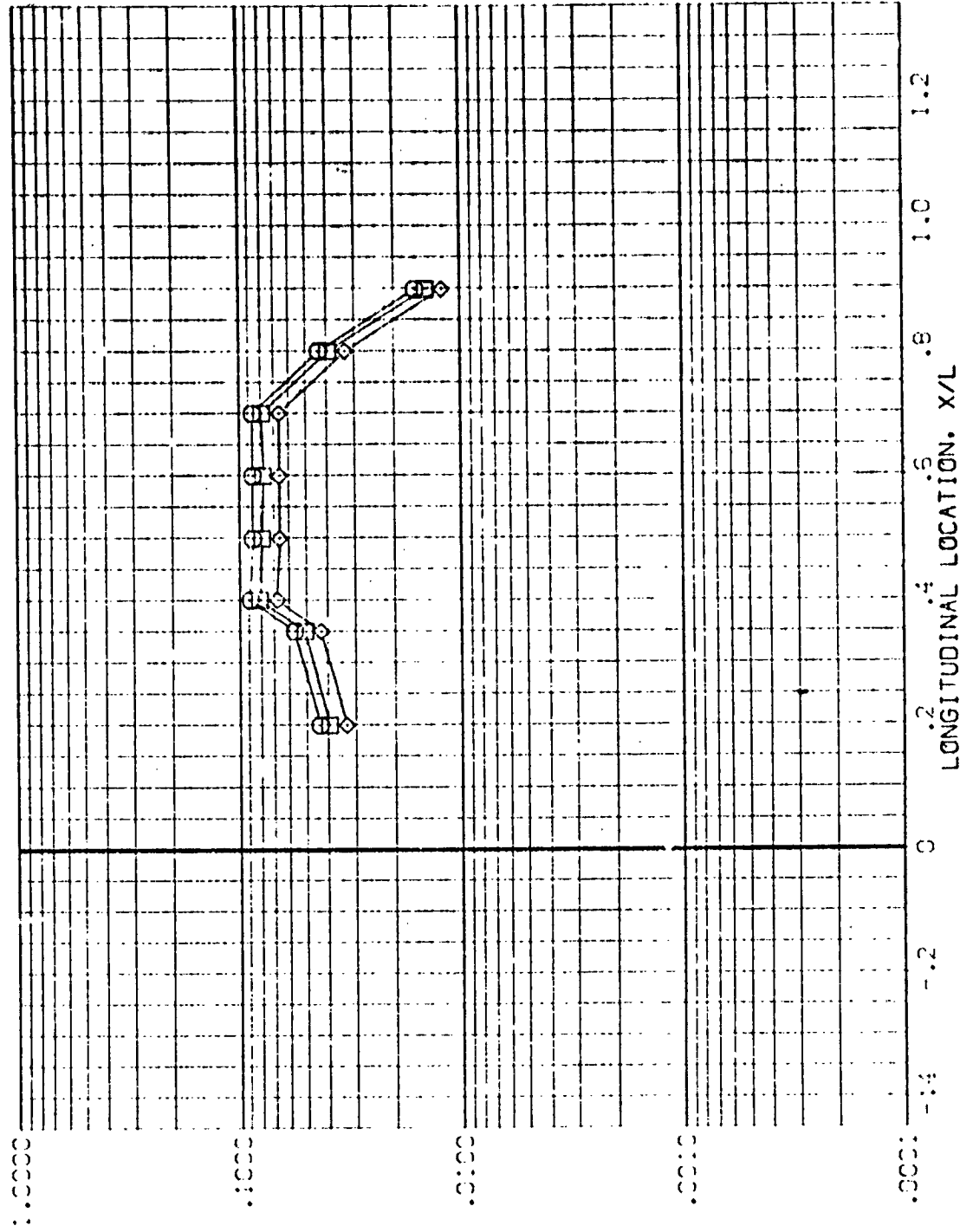


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV1073)

SVSEC- MACH/HT PH: MACH  
 .850 112.500 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 -90.000 BETA  
 .000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

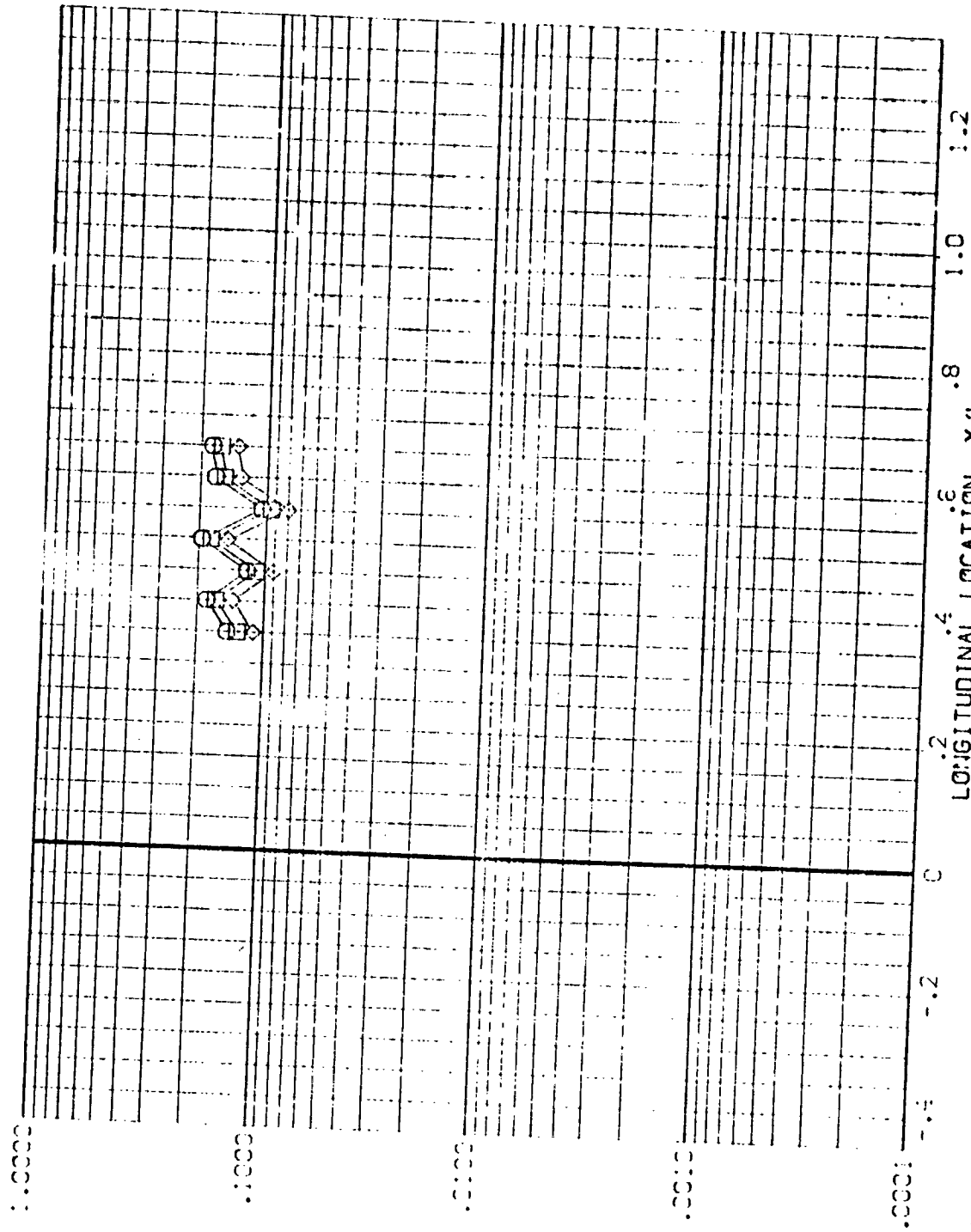


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01-1: EXTERNAL TANK

(REV 07)

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
R/L 1.000

SYMBOLS: H/W/H/T R/L VACH  
1.850 133.000 3.419  
1.000  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

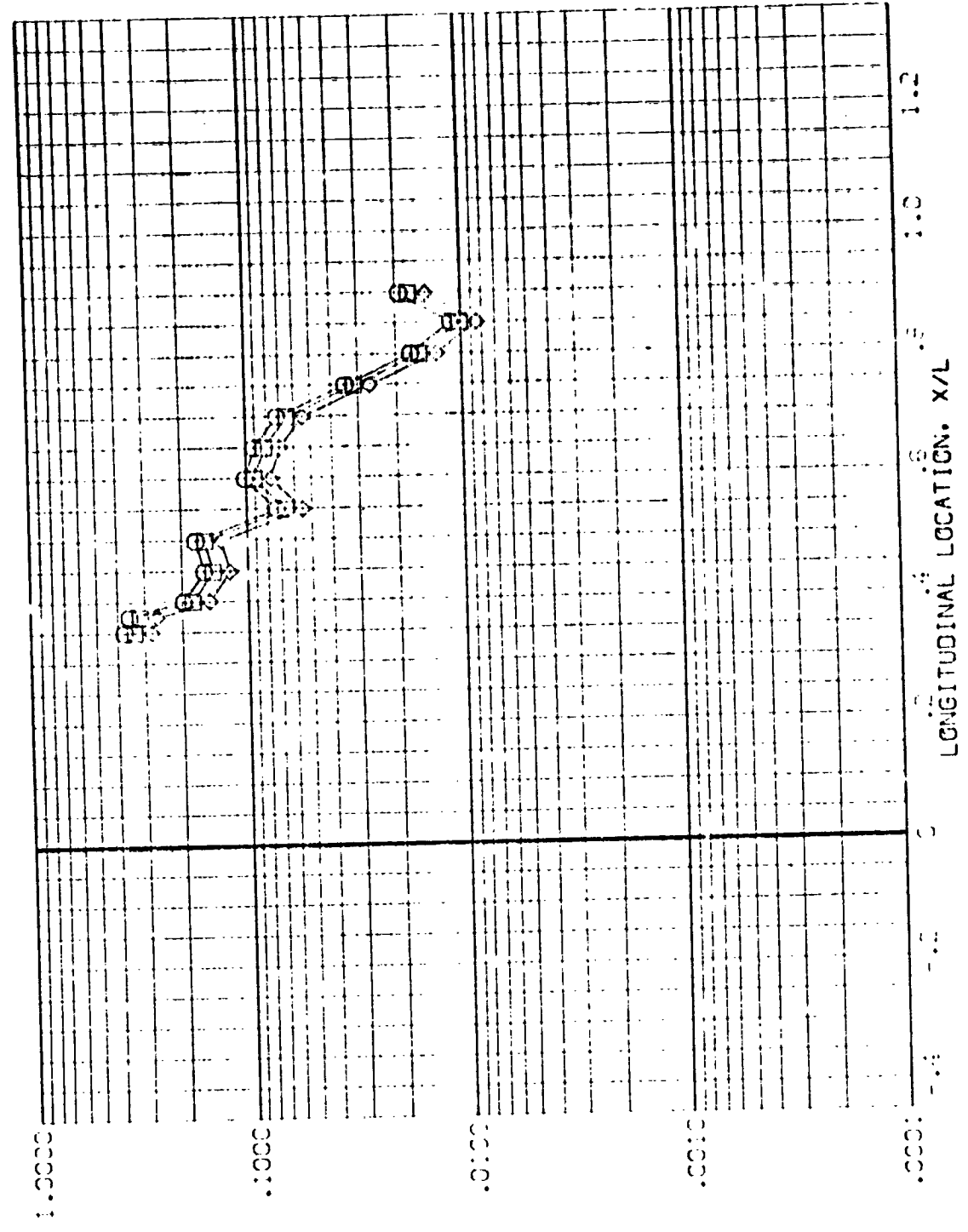


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

YES 3.5-3.5 128 01+1; EXTERNAL TAP

5

[illegible]

1-9-A	- 30.00	BETA
B-7	- 1.00	
	= 30.00 =	JONES

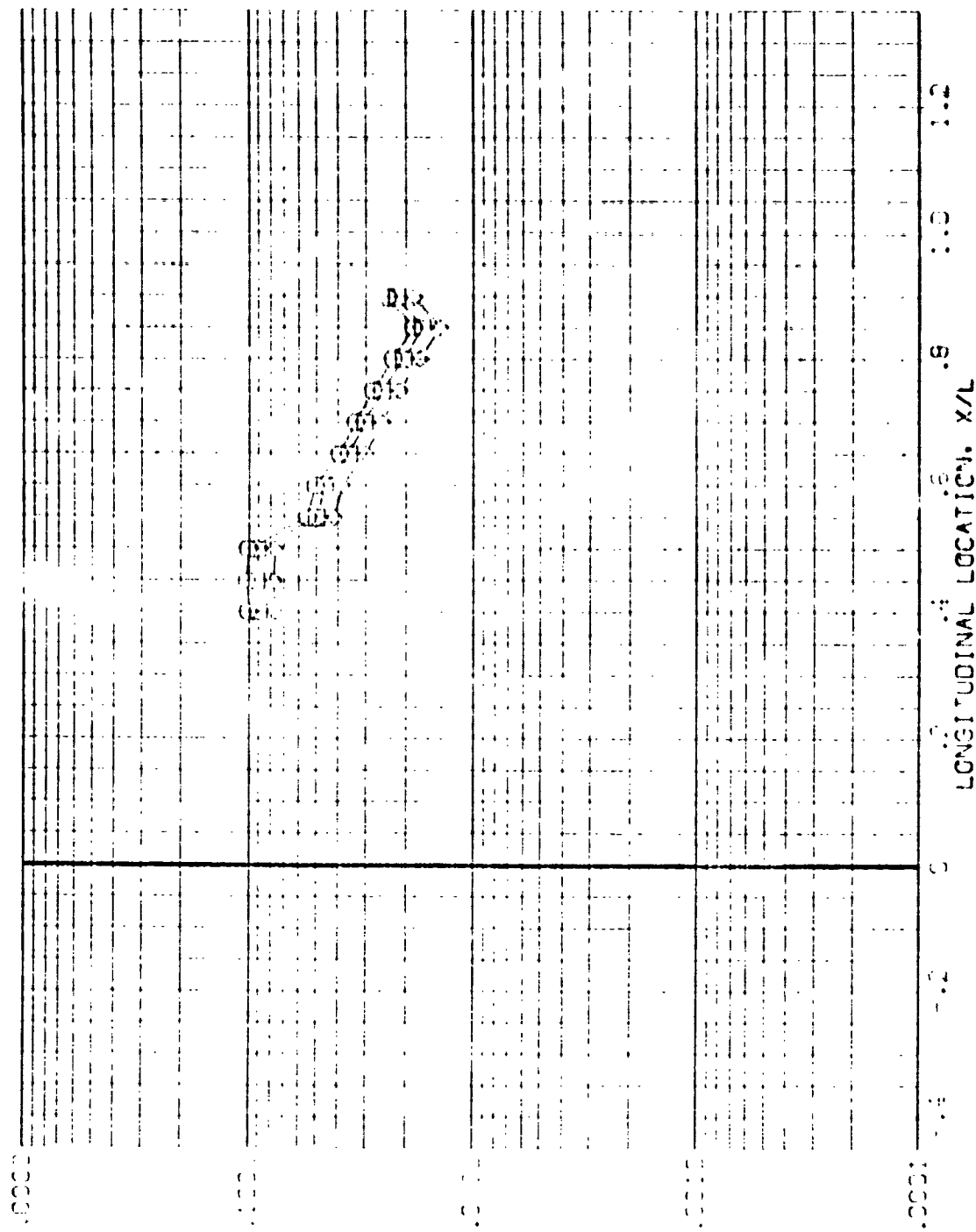
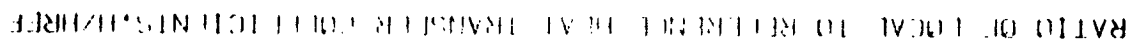


FIG. 5  
TAX. IN THE PRESENCE OF CORTICER

AMES 3.5-100 1-08 C-17: EXTERNAL TANK

(REV. 001)

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 P/L 1.000

SLIDING  
 1.000  
 .900  
 .800  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

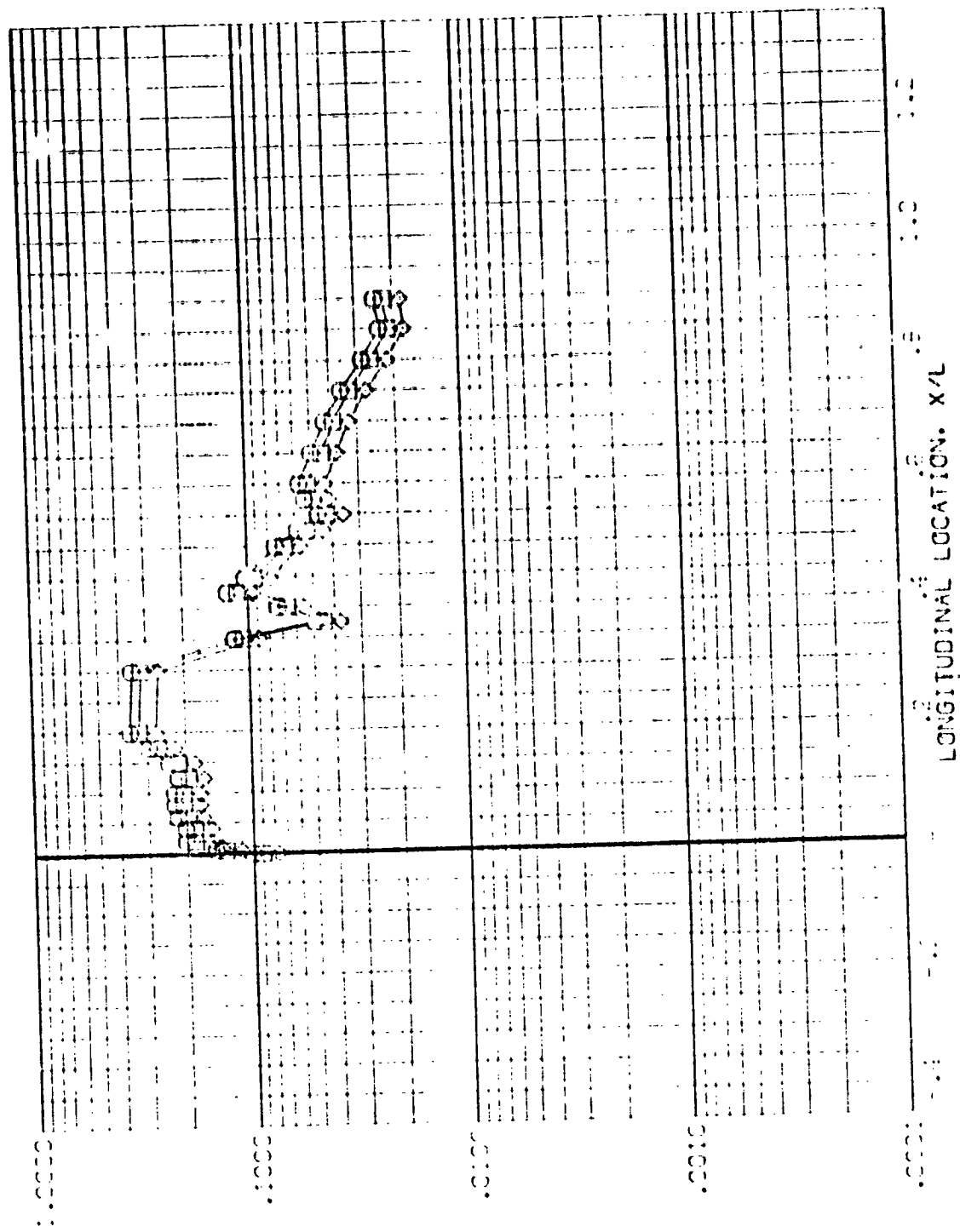


FIG. 5 TANK IN THE PRESENCE OF ORBITER



SYMBOL  
◇ □

HA/WUT PH: MACH  
.850 90.000 5.220  
.900  
1.000

PARAMETER VALUES  
ALPHA -60.000 BETA  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

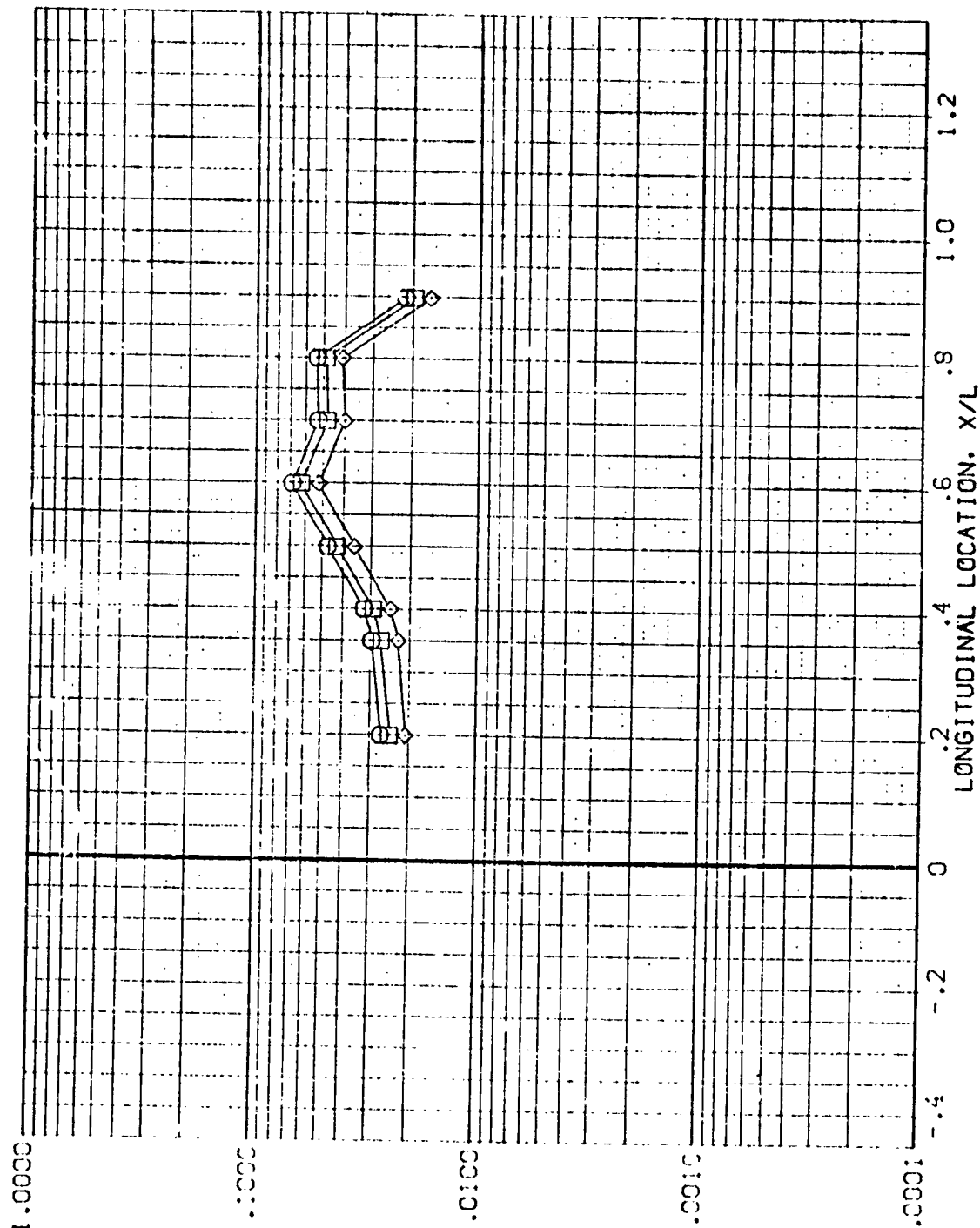


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

1

AVES 3.5-:95 IH28 01+T1 EXTERNAL TANK

(REVTC8)

1  
2  
3  
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5  
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104

5.220

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( )  
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١١٥٠

PARAMETRIC VALUES

AL-2-A

12-2-88

CS-000000

CS-000000

٤٣١

000.

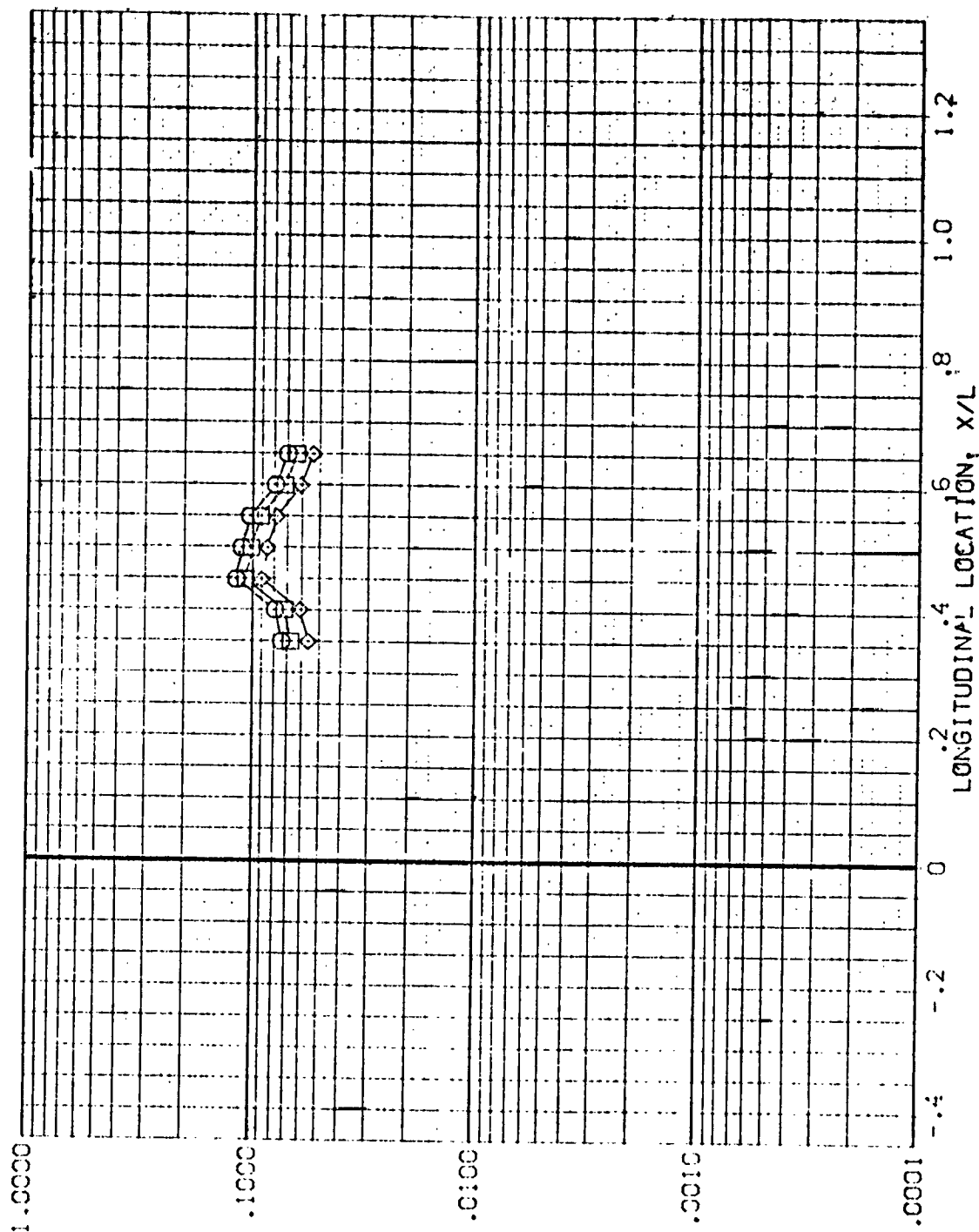
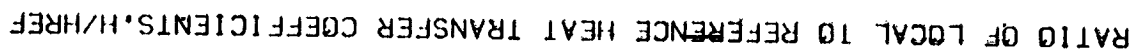


FIG. 5 TANK, IN THE PRECENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SYMBOL  
 □  
 ◇

HA/HT .850  
 PH: 135.000  
 MACH 5.220

PARAMETRIC VALUES  
 ALPHA -60.000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

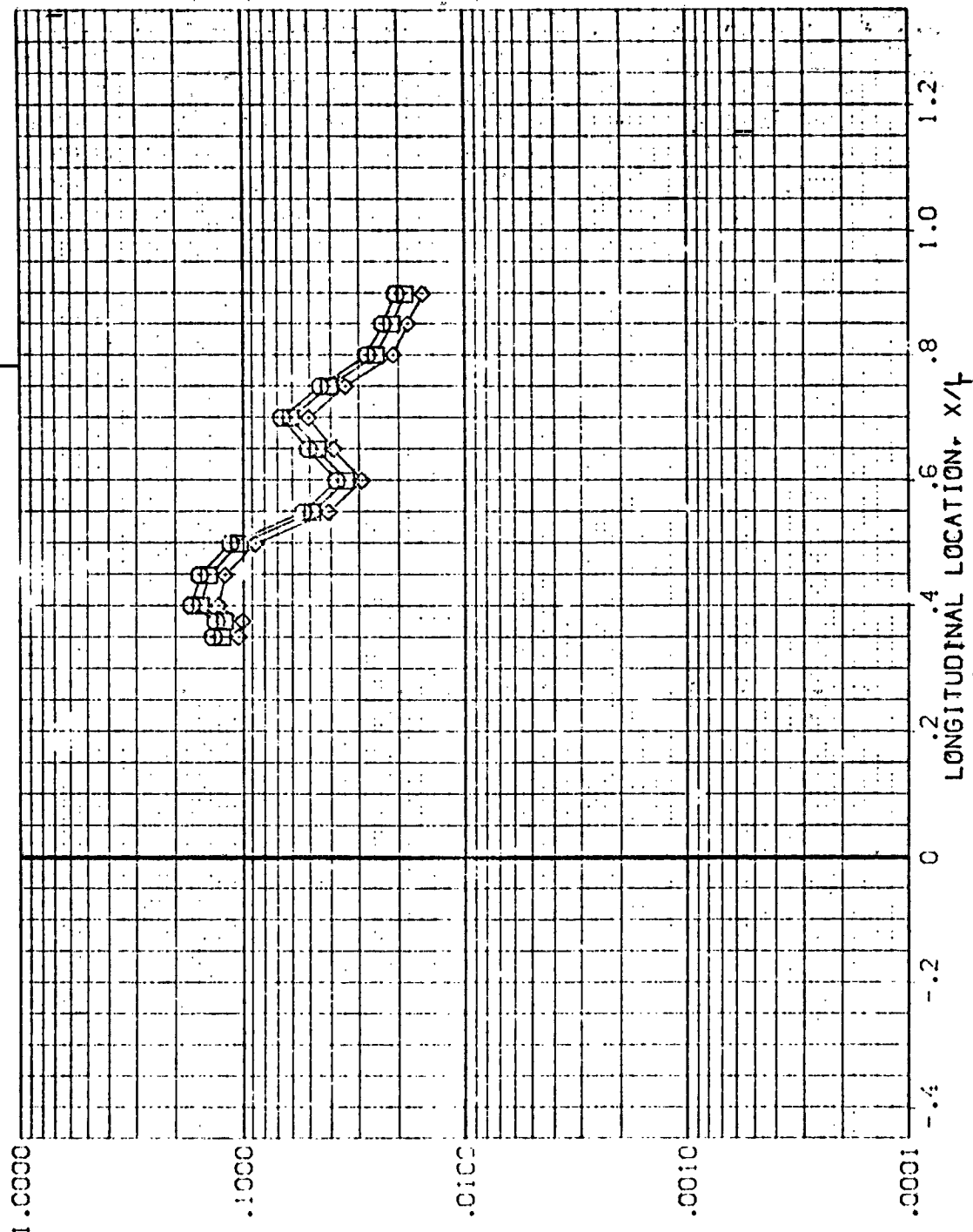


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

S-VEE-  
 HAN/UT  
 .850  
 .300  
 1.000  
 PFI  
 157.500  
 VACH  
 5.220  
 AVES 3.5-195 1428 01+T1 EXTERNAL TANK  
 (REV T08)  
 PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -50.000  
 1.000  
 BETA  
 .000

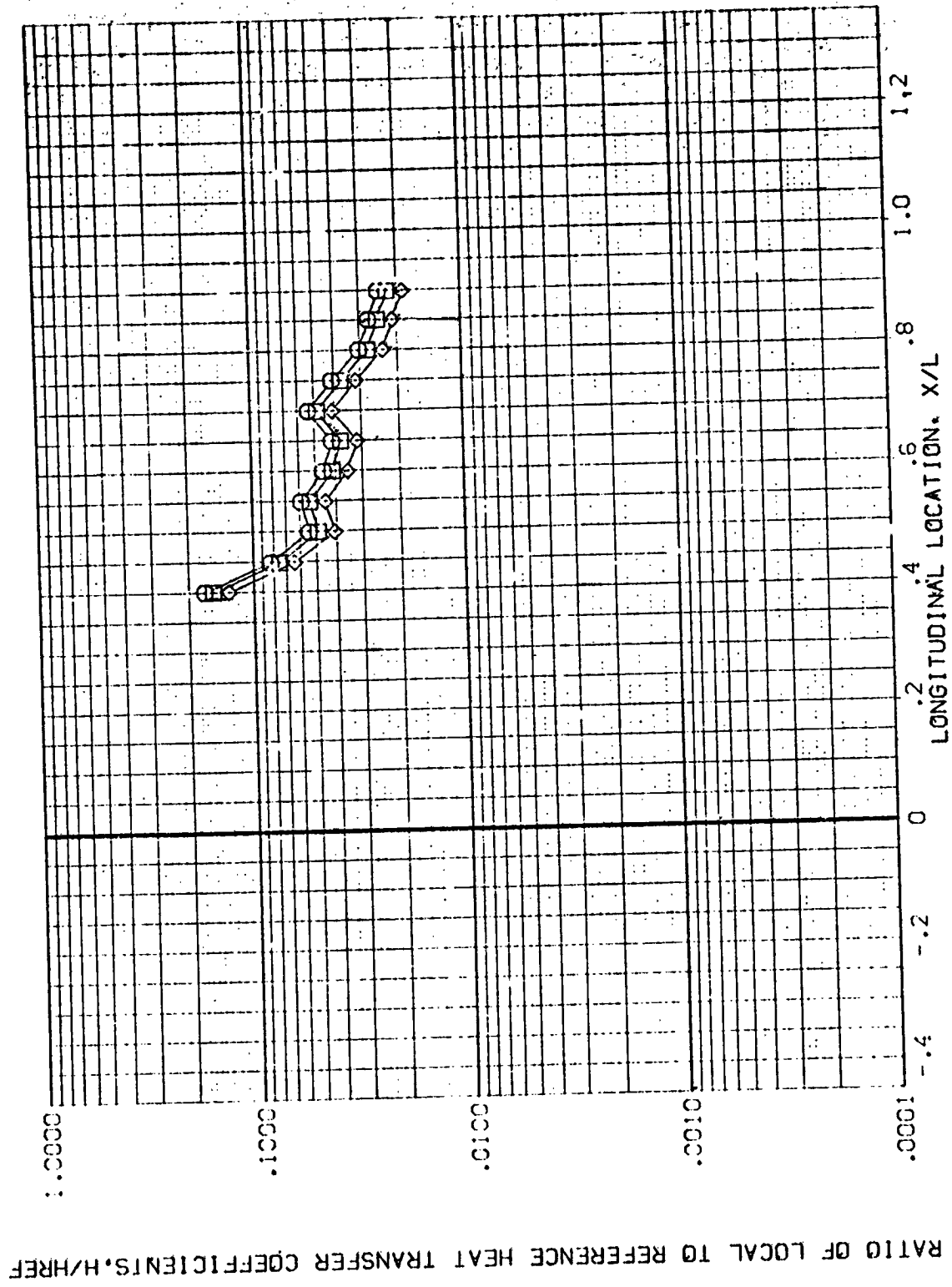


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SYMBOL

HAW/HT  
.852  
.900  
1.000

PHI  
180.000  
MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RN/L  
-60.000  
1.000  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

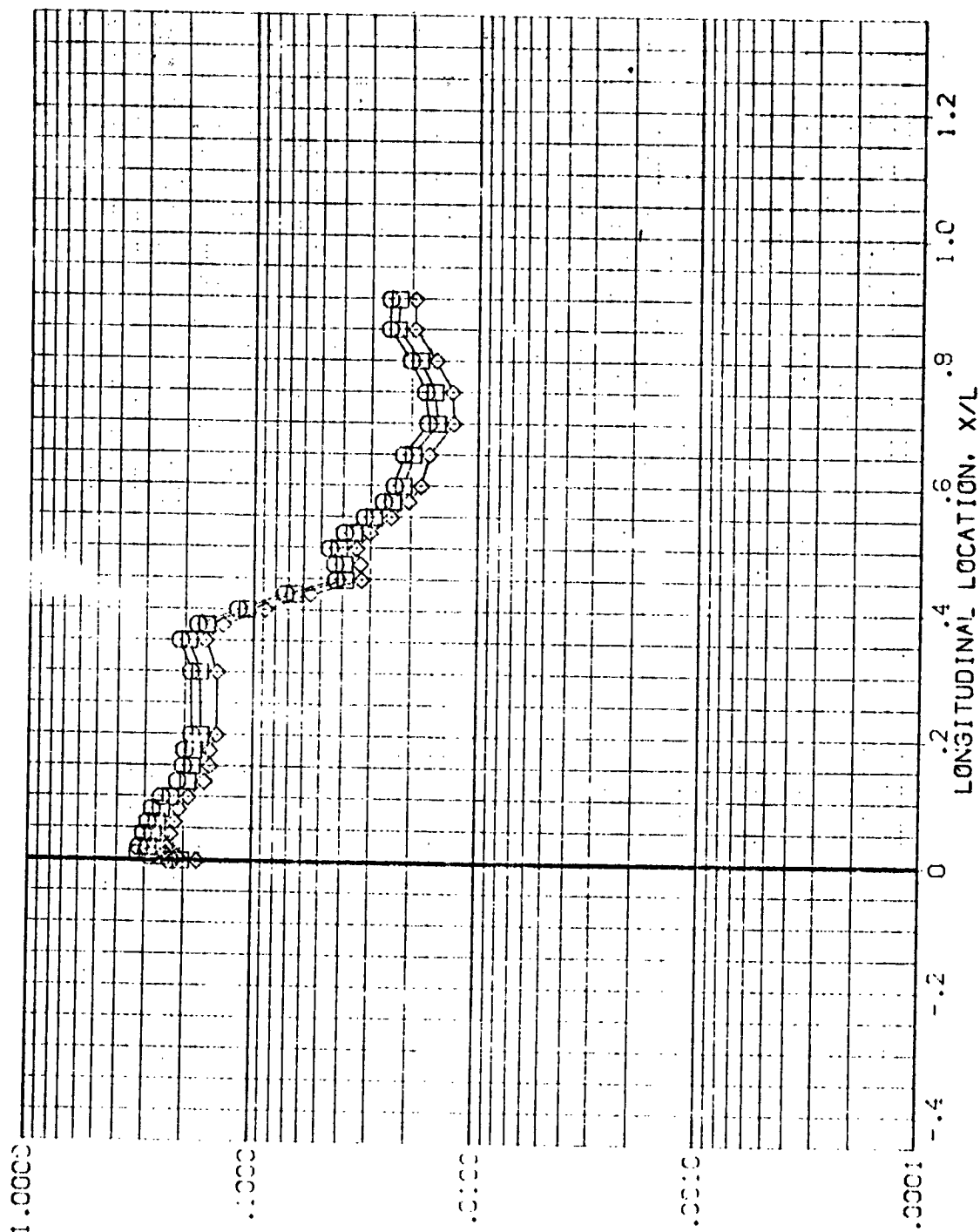


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-10E 1-29 01+T1 EXTERNAL TANK

(REV109)

SIZE	PARAM	REF	WICH	PARAMETRIC VALUES
0.850	0.850	0.850	0.850	ALPHA
0.850	0.850	0.850	0.850	BETA
0.850	0.850	0.850	0.850	RV/L
0.850	0.850	0.850	0.850	

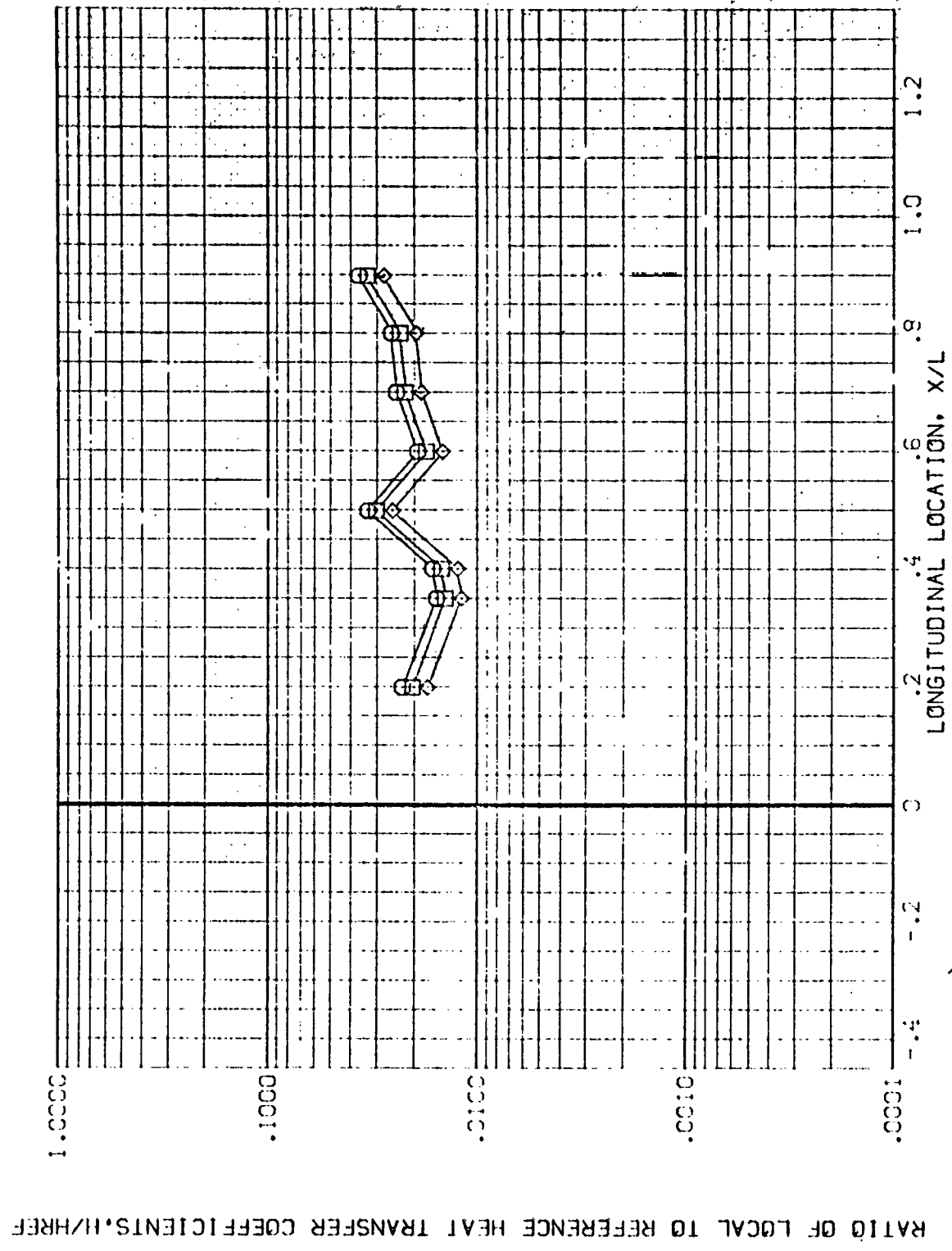


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T09)

SYMBOL

WAS/HT

PMI

MACH

.950  
.900  
1.000

112.500

5.219

PARAMETER VALUES

ALPHA  
PM/L

-30.000  
1.000

BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

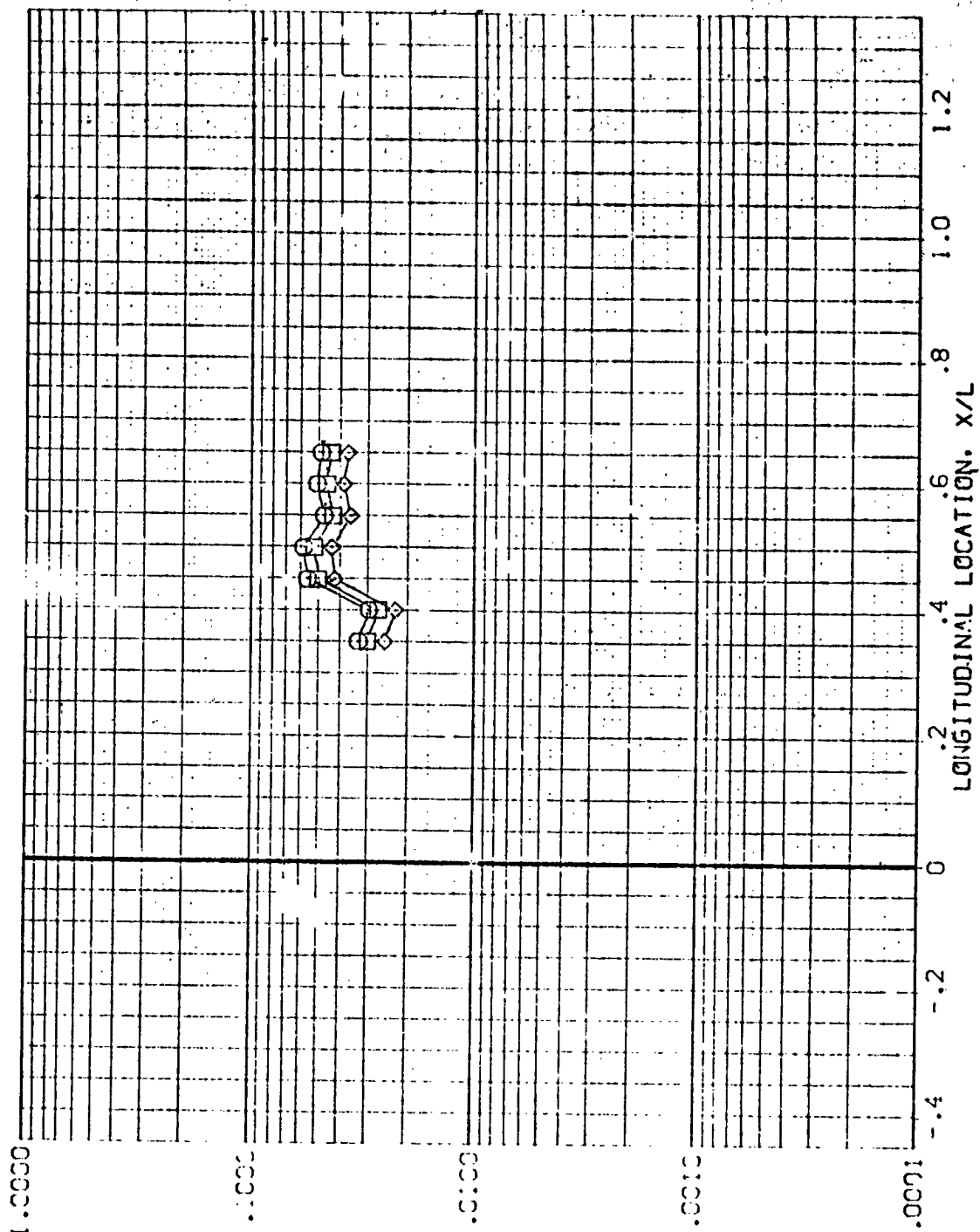


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T09)

Q110

MAF/LIN PLI MACH  
 .350 .35.000 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

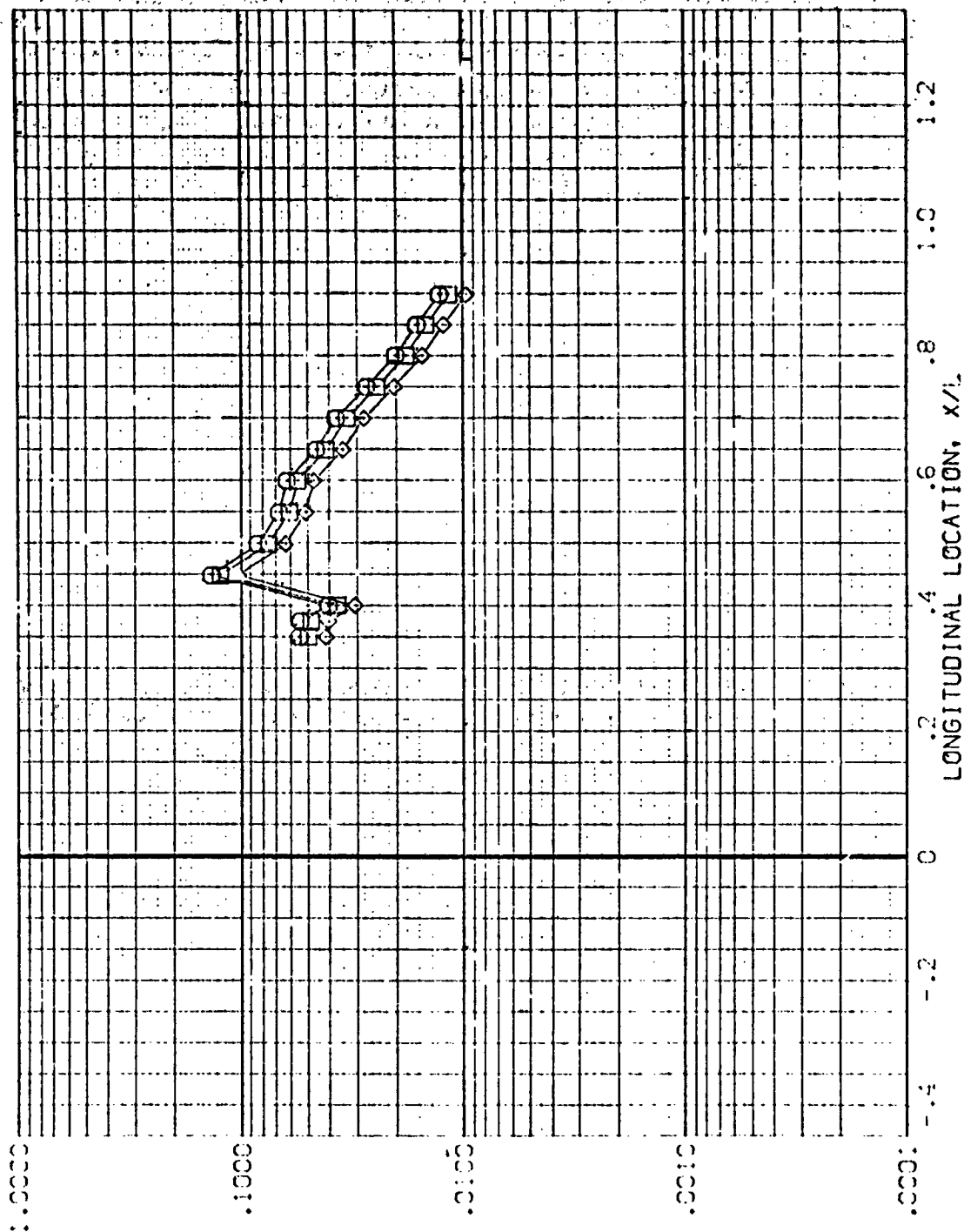


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AMES 3.5-195 IH28 01+71 EXTERNAL TANK

(REV109)

SYMBOL

HA/HT  
.850  
.900  
1.000

PHI  
157.500

MACH  
5.219

PARAMETRIC VALUES  
ALPHA  
RN/L  
-30.000  
1.000  
BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

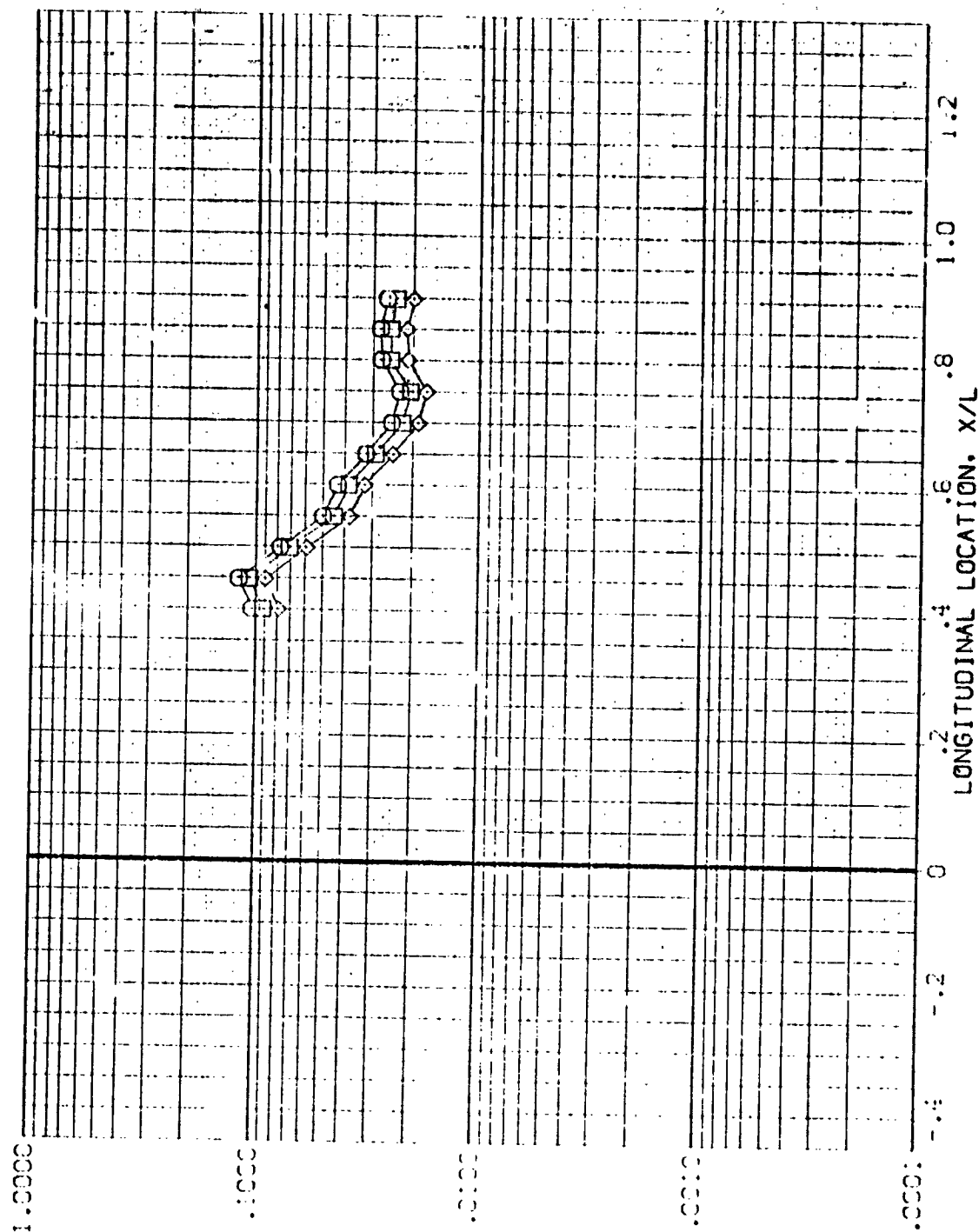


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AVES 3.5-195 1-28 01+T1 EXTERNAL TANK

(REV T09)

SVES: HAW/HT PW: MACH  
 .850 .850 5.219  
 .300  
 1.000

PARAMETRIC VALUES  
 ALPHA -33.000 BETA  
 RN/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

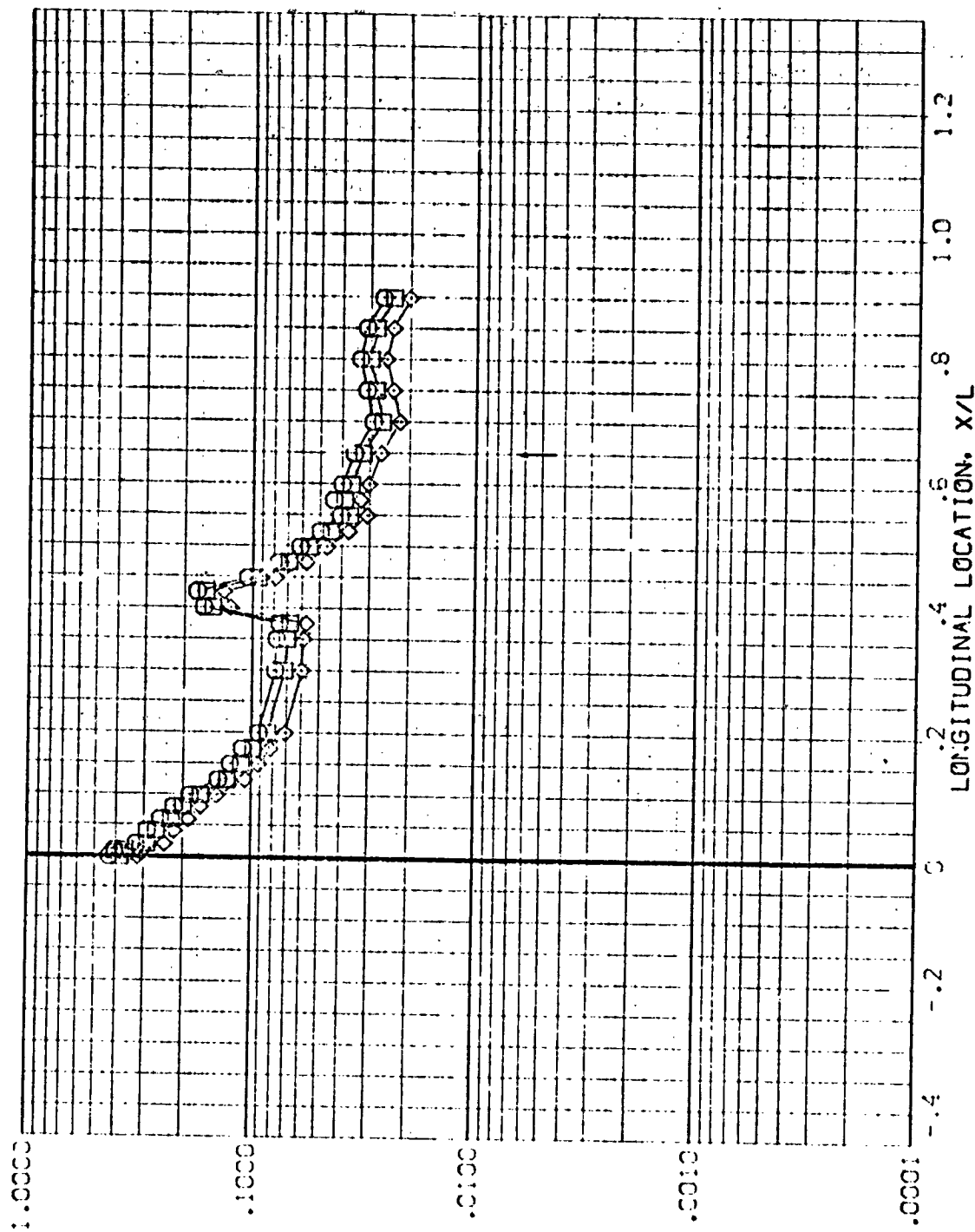


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  
 H/W/H  
 .850  
 .900  
 .950  
 1.000

W/L  
 90.000  
 5.300

PARAMETRIC VALUES  
 ALPHA  
 80.000  
 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

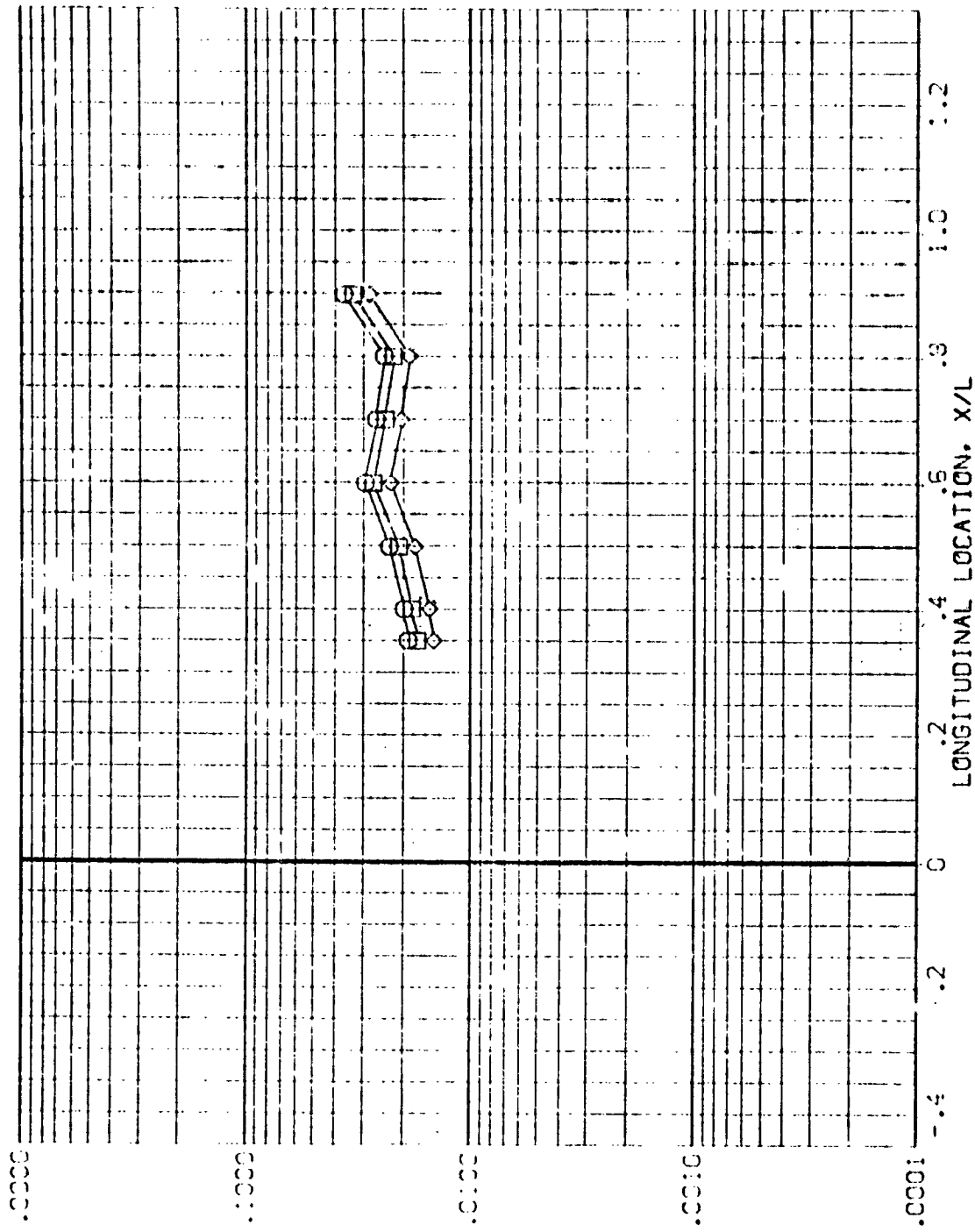


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01+11 EXTERNAL TANK

(REV 7103)

SYMBOL HAW/FT PH: MACH  
 □ .850 112.500 5.300  
 ○ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 PW/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

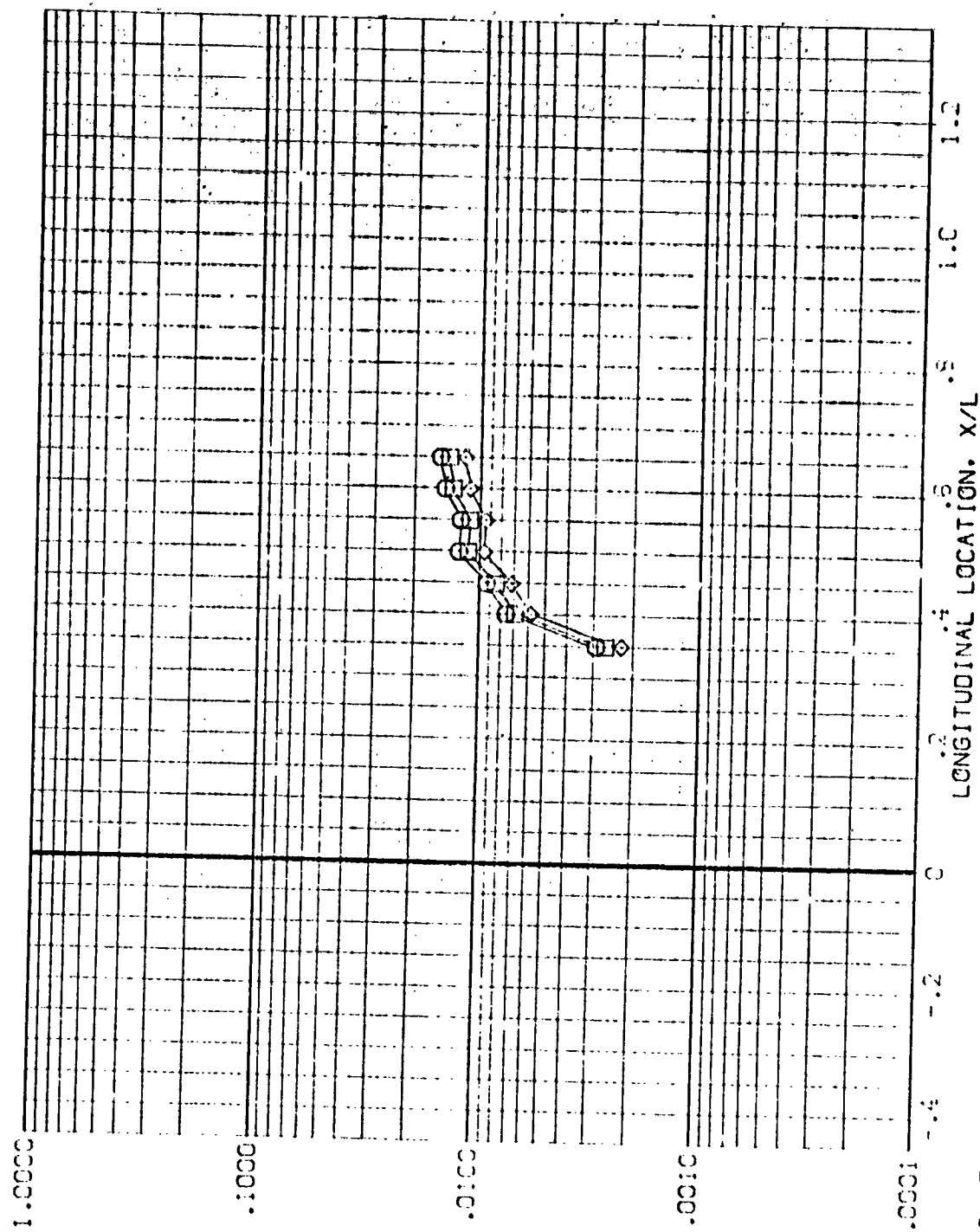


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 I-28 31-T1 EXTERNAL TANK

(REV:13)

S.WGT. 1.0000  
 HAW/HT .850  
 PLI 135.000  
 WACH 5.300

PARAMETER VALUES  
 ALPHA 60.000  
 BETA 4.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

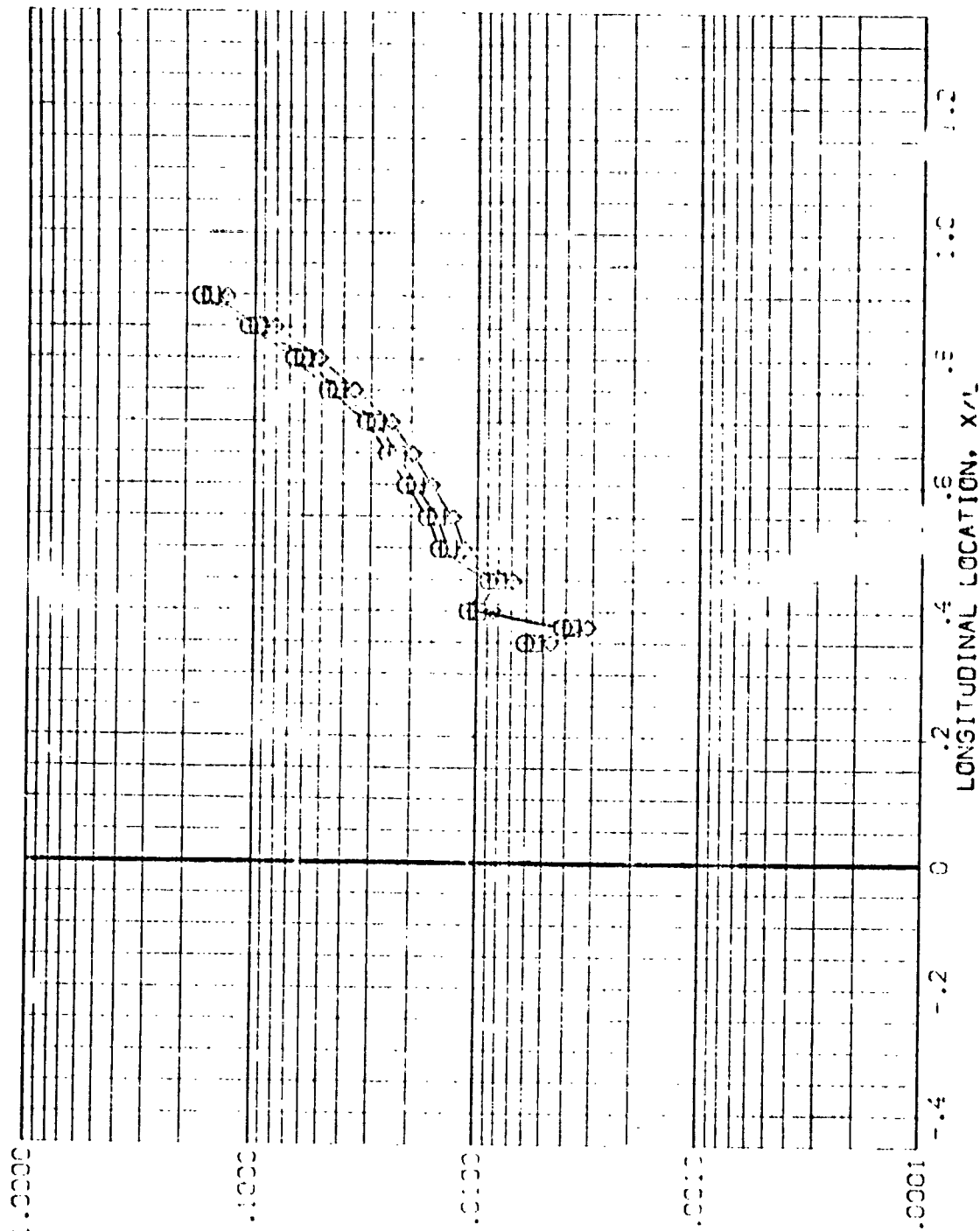


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01+T1 EXTERNAL TANK

(REV:10)

SYMBOL HEIGHT F-1 MACH  
 ○ .850  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 4.000  
 RV/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

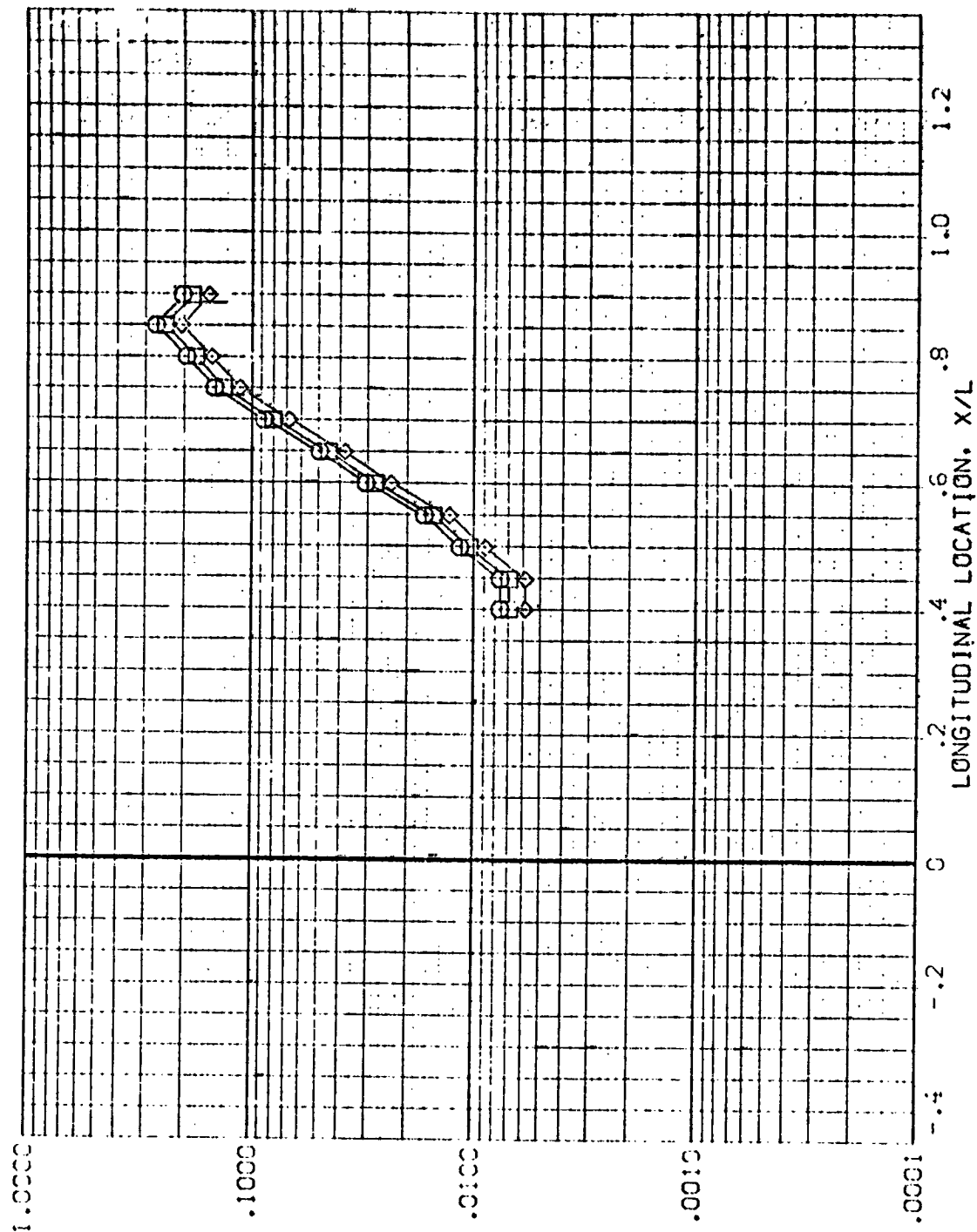


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3,5-195 1H28 01+T1 EXTERNAL TANK

(REV 10)

SYMBOL

HAW/HT

PHI

MACH

◇

□

.850

180.000

5.300

.900

1.000

ALPHA

PN/L

60.000

4.000

ETA

1.000

PARAMETER VALUES

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

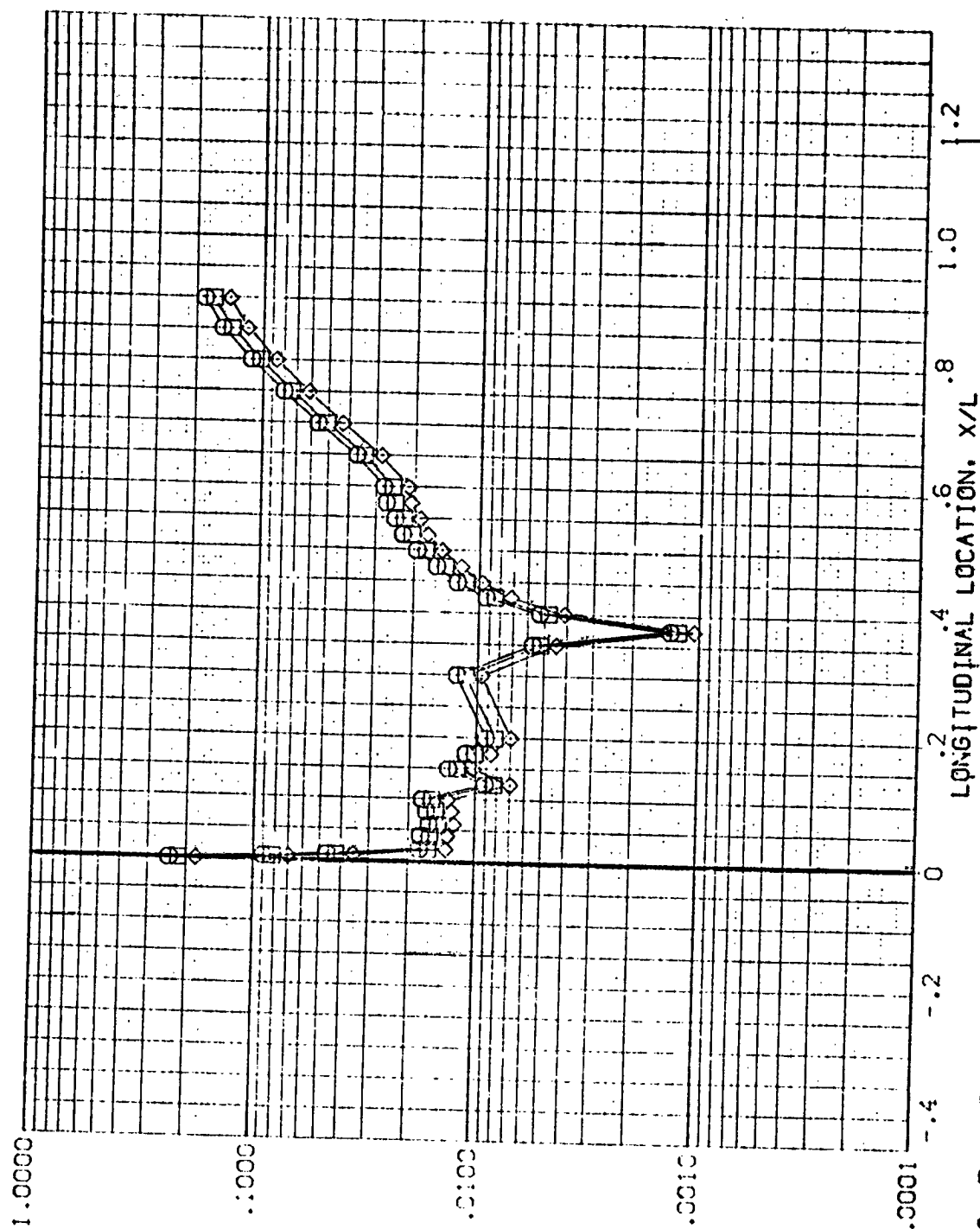


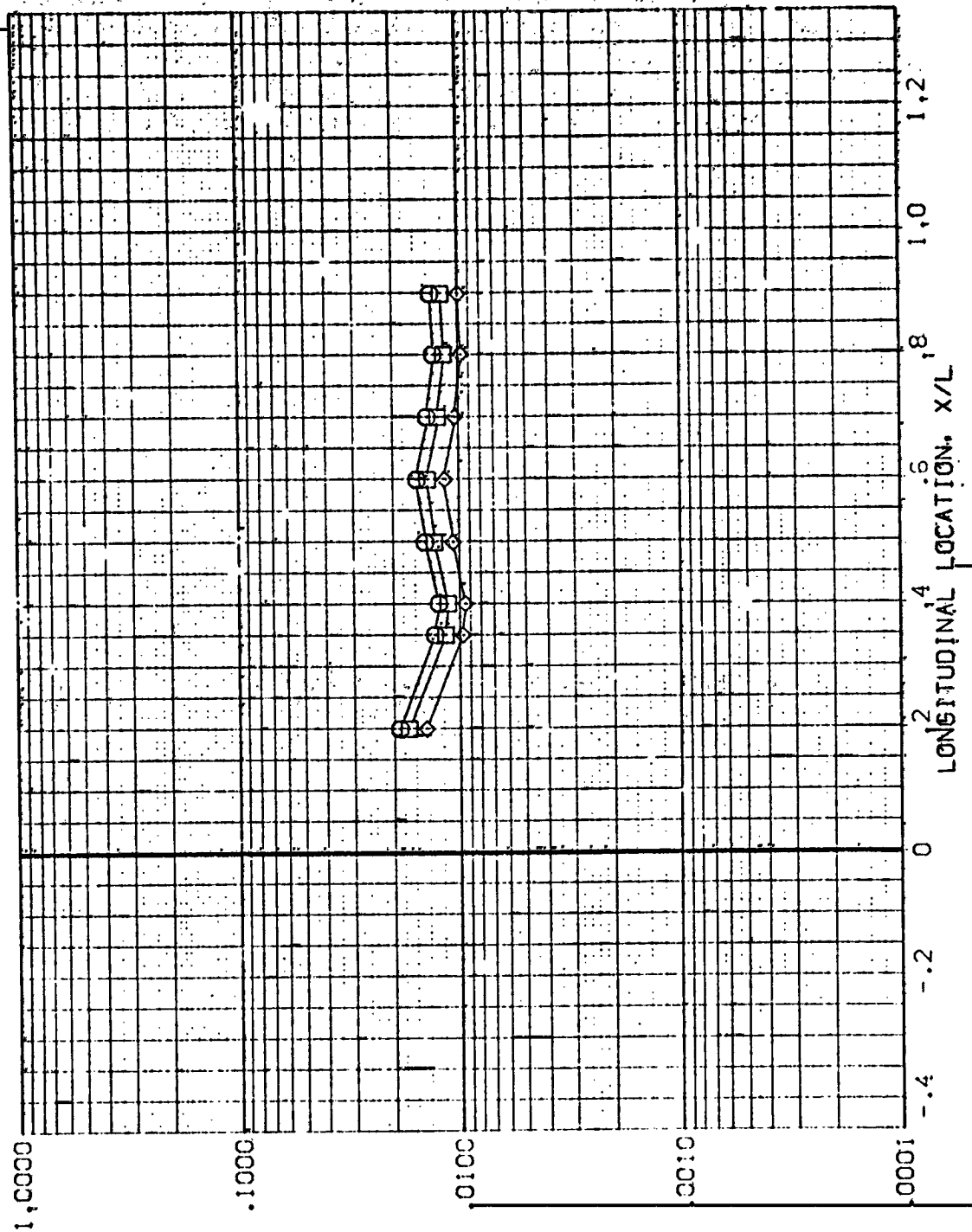
FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T11)

SYMBOL    HAW/HT    PHI    MACH    PARAMETRIC VALUES  
 ◇    .850    90.000    5.300    ALPHA    BETA  
      .900                            30.000    4.000  
      1.000                                    

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF



REPRODUCIBILITY OF FIG. 5 TANK, IN THE PRESENCE OF ORBITER  
 ORIGINAL PAGE IS FOR



# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV111)

SYMBOL  
 □  
 ◇

HAY/HT 1.850  
 PW 112.500  
 MACH 5.300

PARAMETRIC VALUES  
 ALPHA 30.000  
 RAYL 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

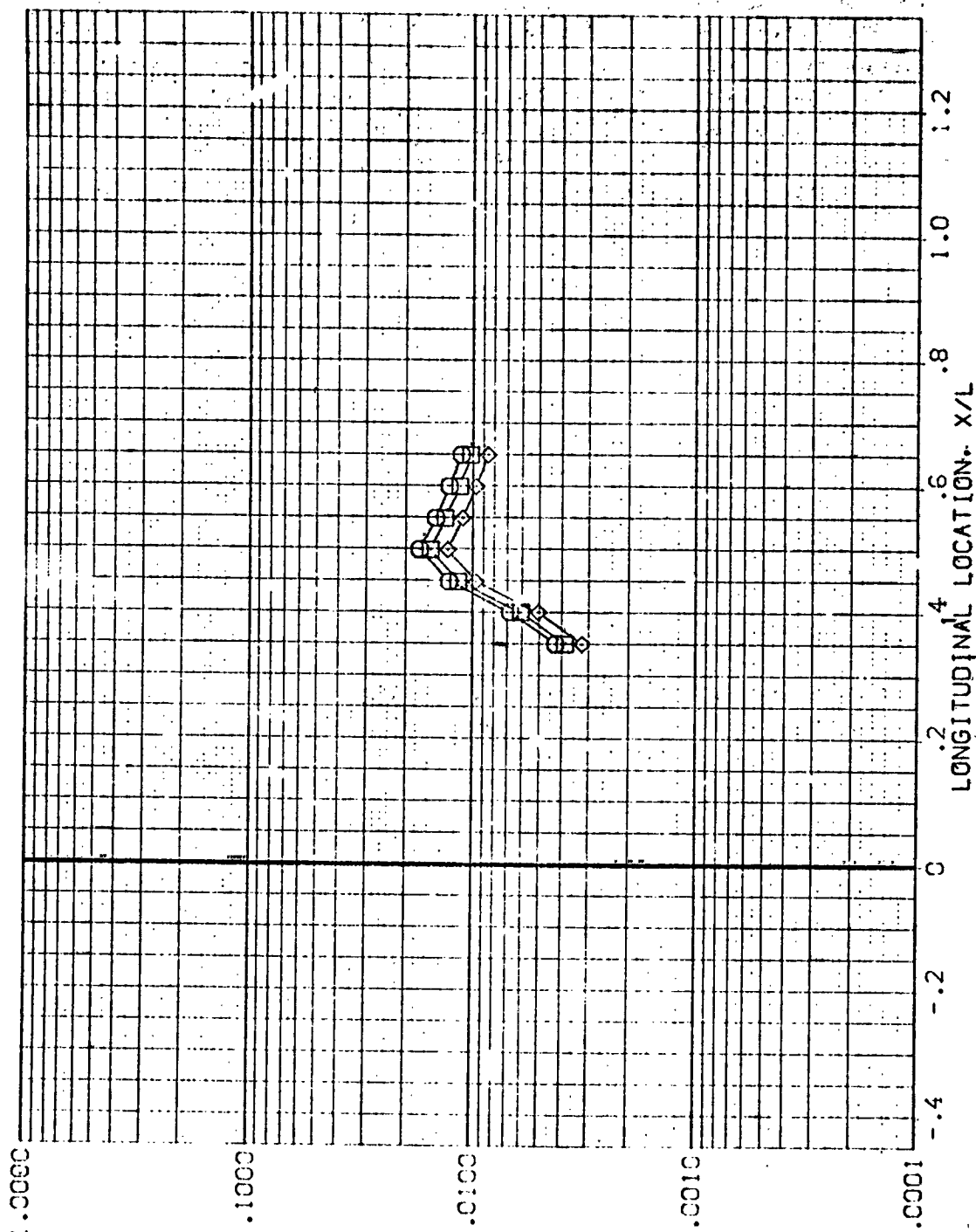


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3,5-195

01-T1 EXTERNAL TANK

(REV 11)

SYMBOL  
 ◇  
 □  
 ○

WAV/HT .850  
 P4: .35.000  
 MACH 5.300  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 4.300  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

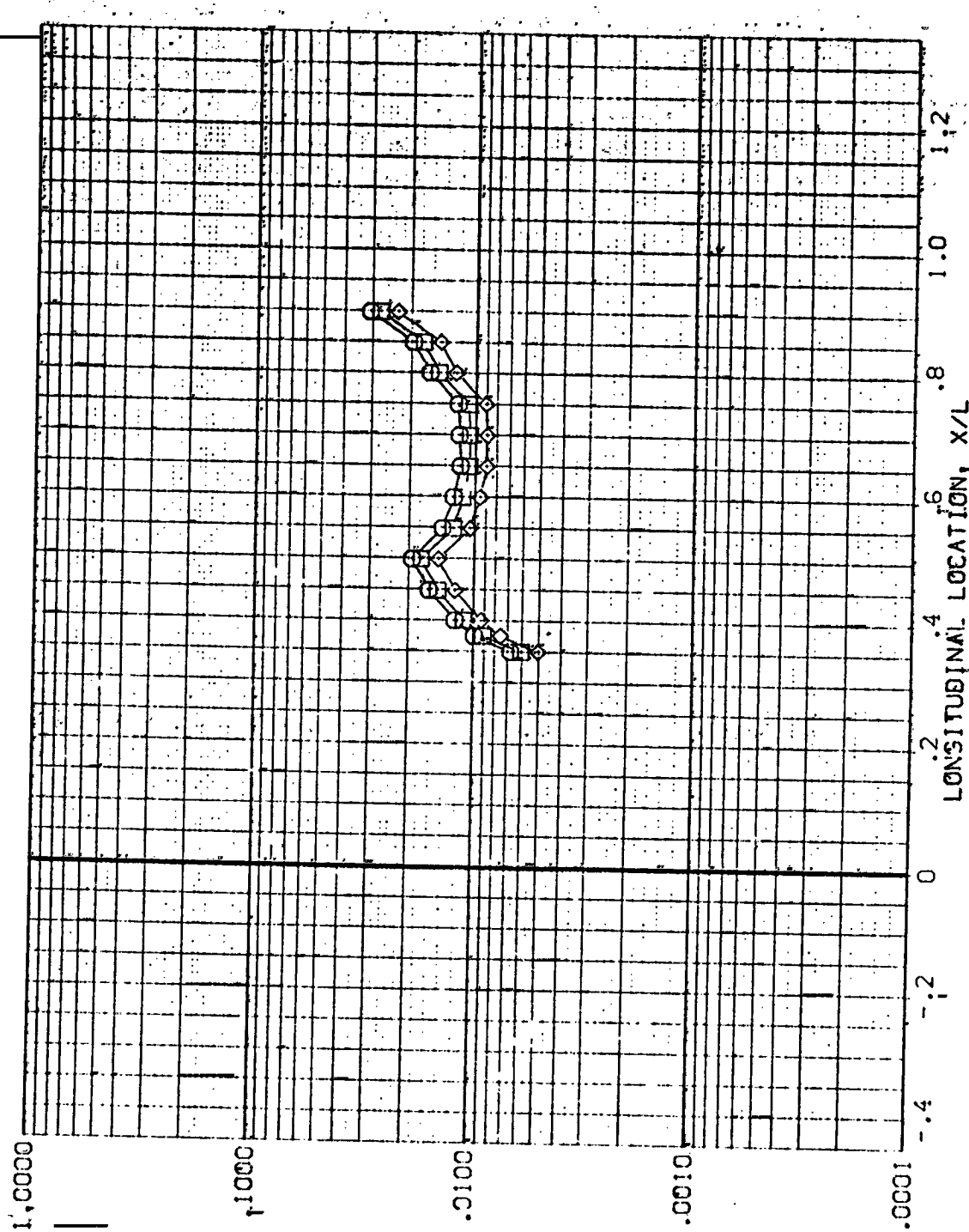


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV 11)

SYMBOL  
 444/HT  
 .850  
 .900  
 1.000

PHI  
 157.500  
 MACH  
 5.300

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 4.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

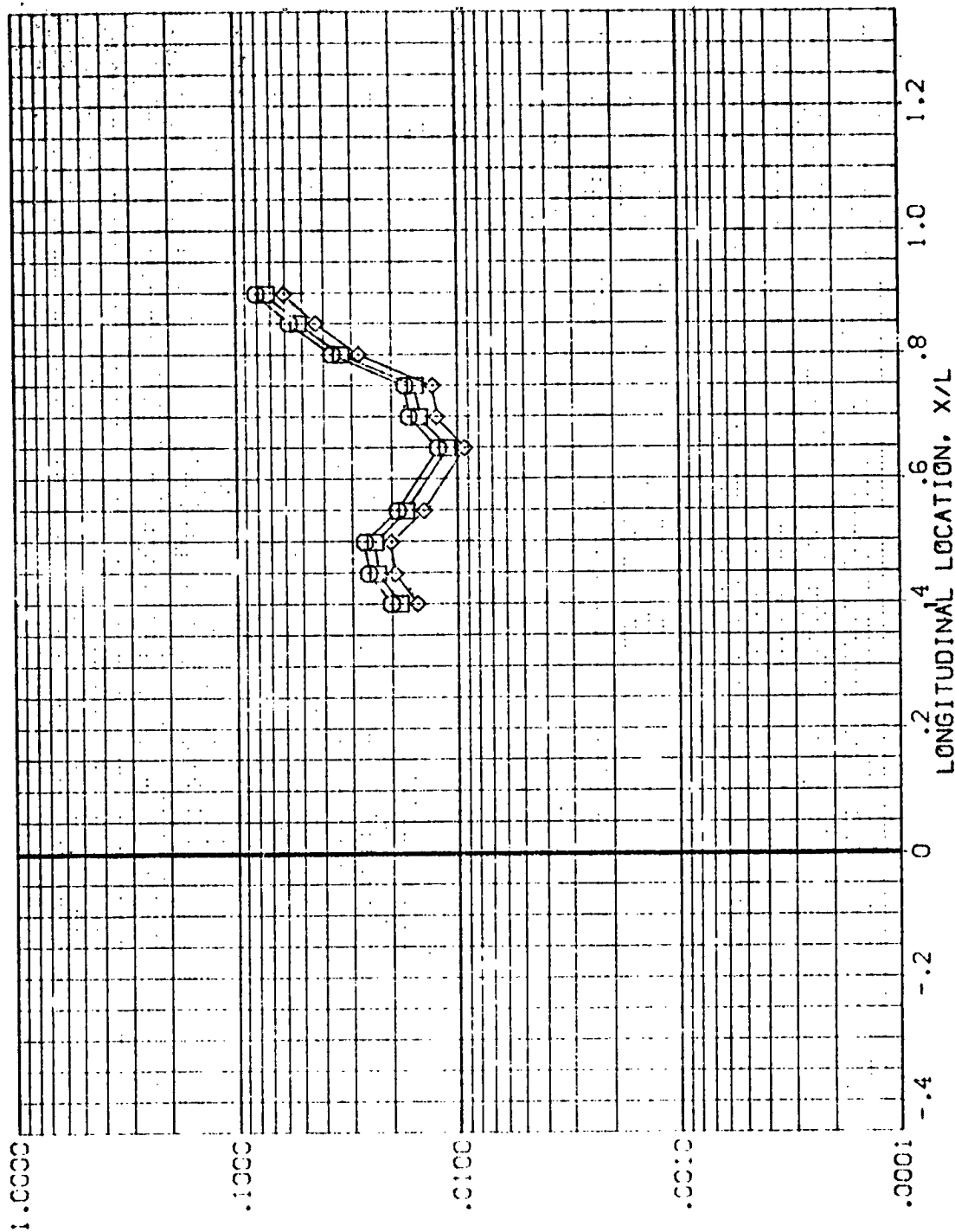


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AXES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV111)

SYMBOL HAY/LT PNT MACH  
 □ .850 190.000 5.300  
 ○ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA 33.000 BETA .000  
 RN/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

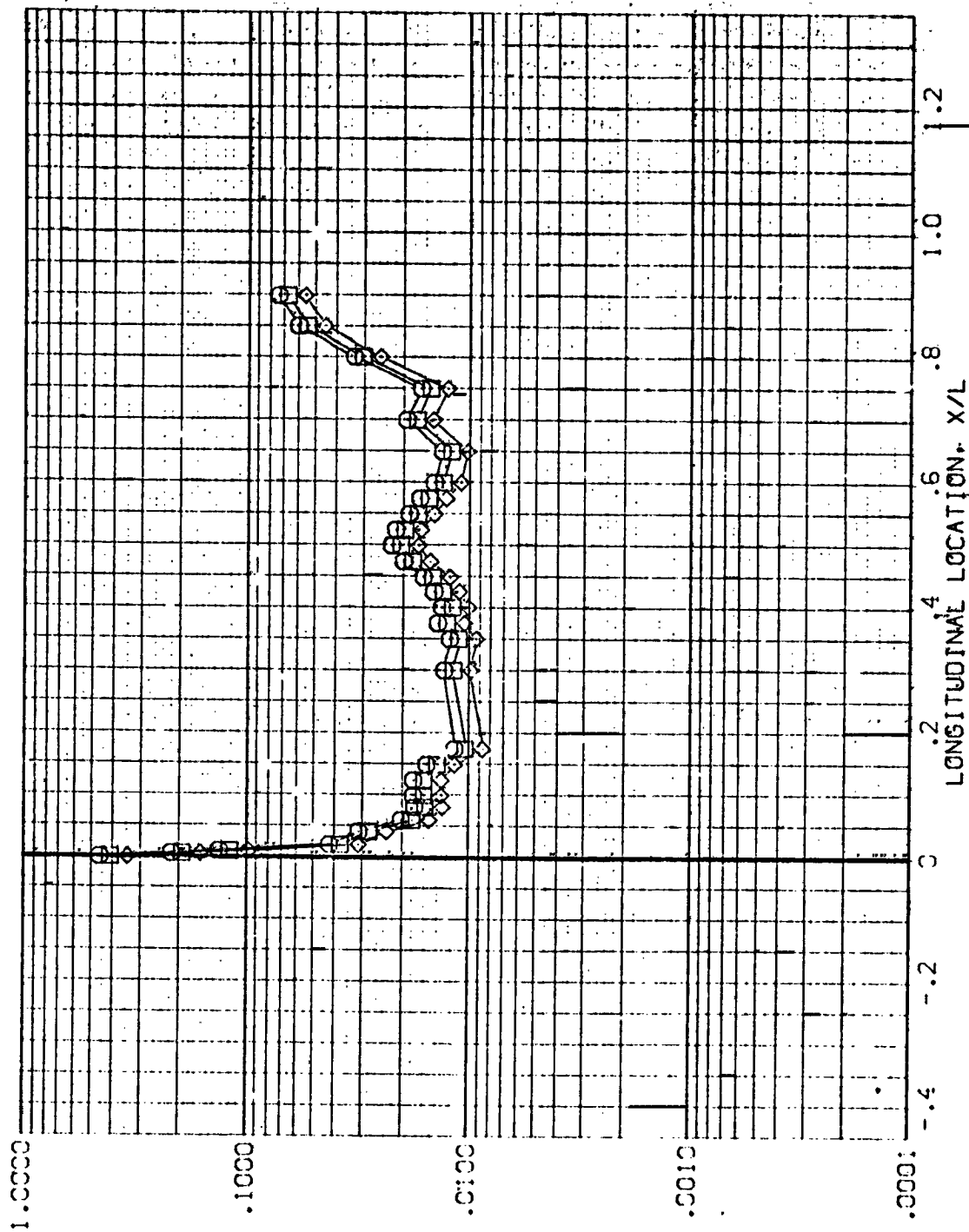


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T12)

SYNCL

WAV/HT  
.850  
.900  
1.000

PHI  
90.000

MACH  
5.219

PARAMETRIC VALUES

ALPHA 30.000  
RV/L 1.000  
BETA -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

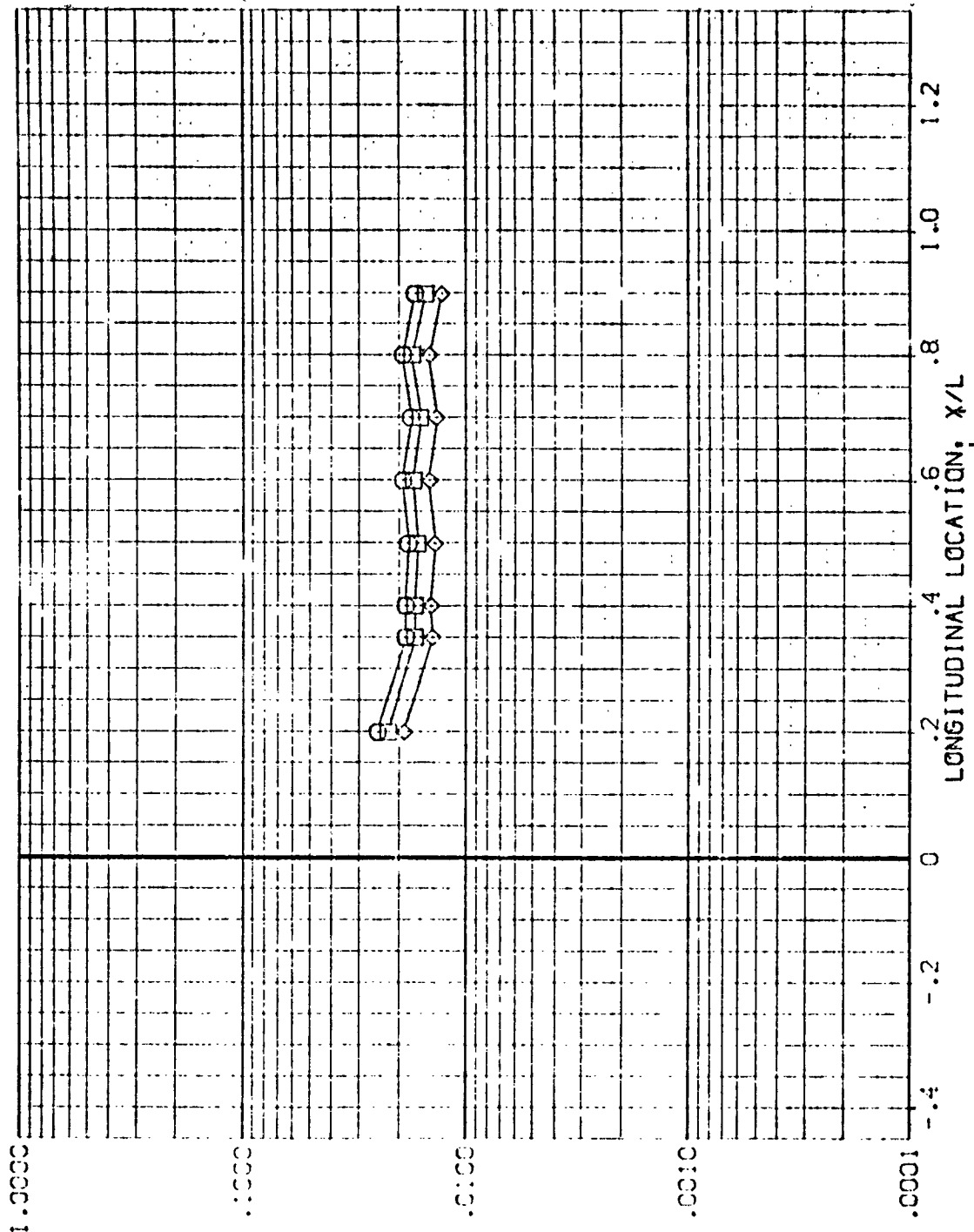


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV12)

SYMBOL: H<sub>0</sub>/L<sub>0</sub>    P-1    "ACH    5.219  
 .850    112.500  
 .200  
 1.000

PARAMETRIC VALUES  
 ALPHA    30.000    BETA  
 RN/L    1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

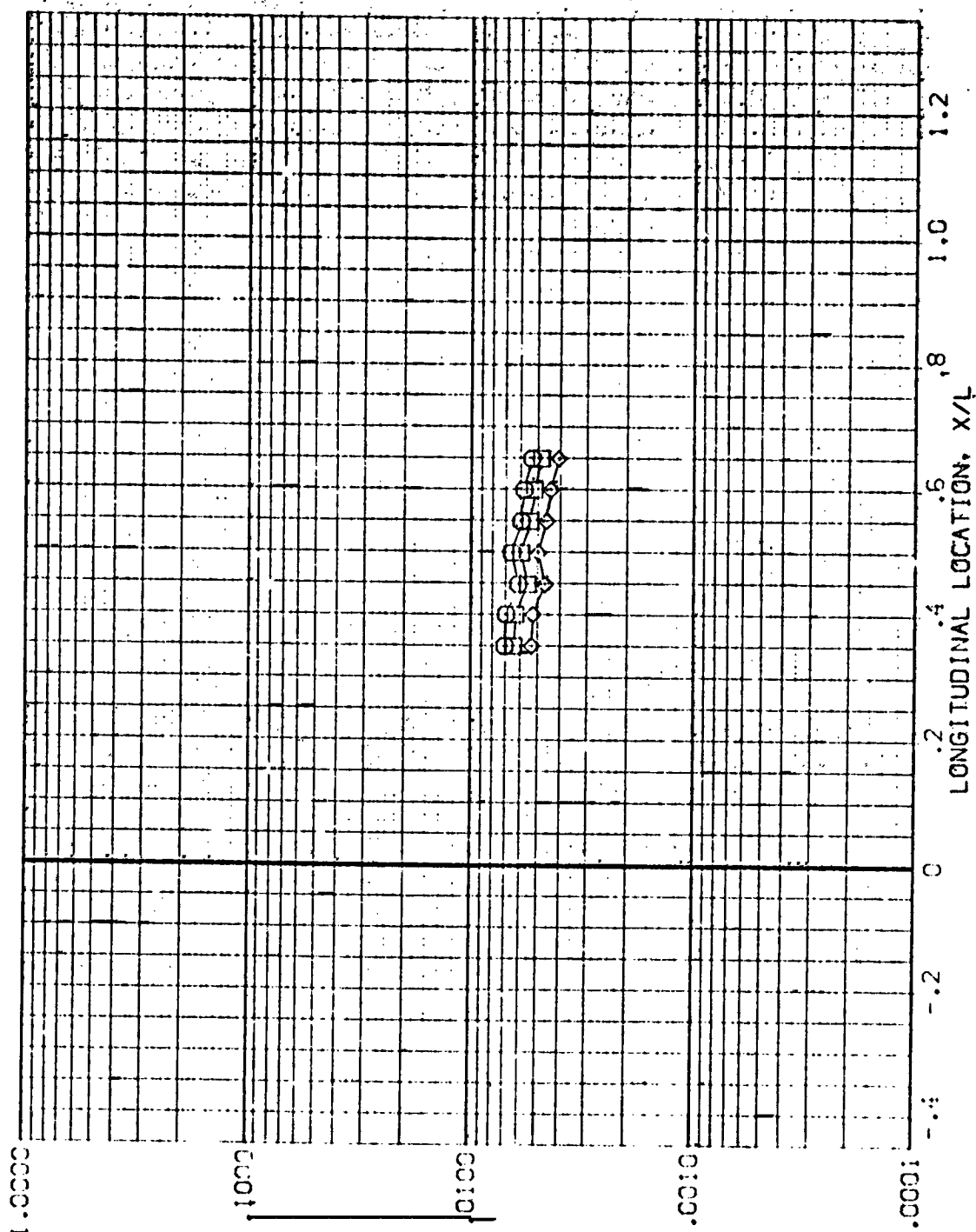


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV112)

SYMBOL  
 □  
 ◇

WAV/HT .850  
 PH: 135.000  
 MACH 5.219

PARAMETER VALUES  
 ALPHA 30.000  
 BETA 1.000  
 RN/L -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

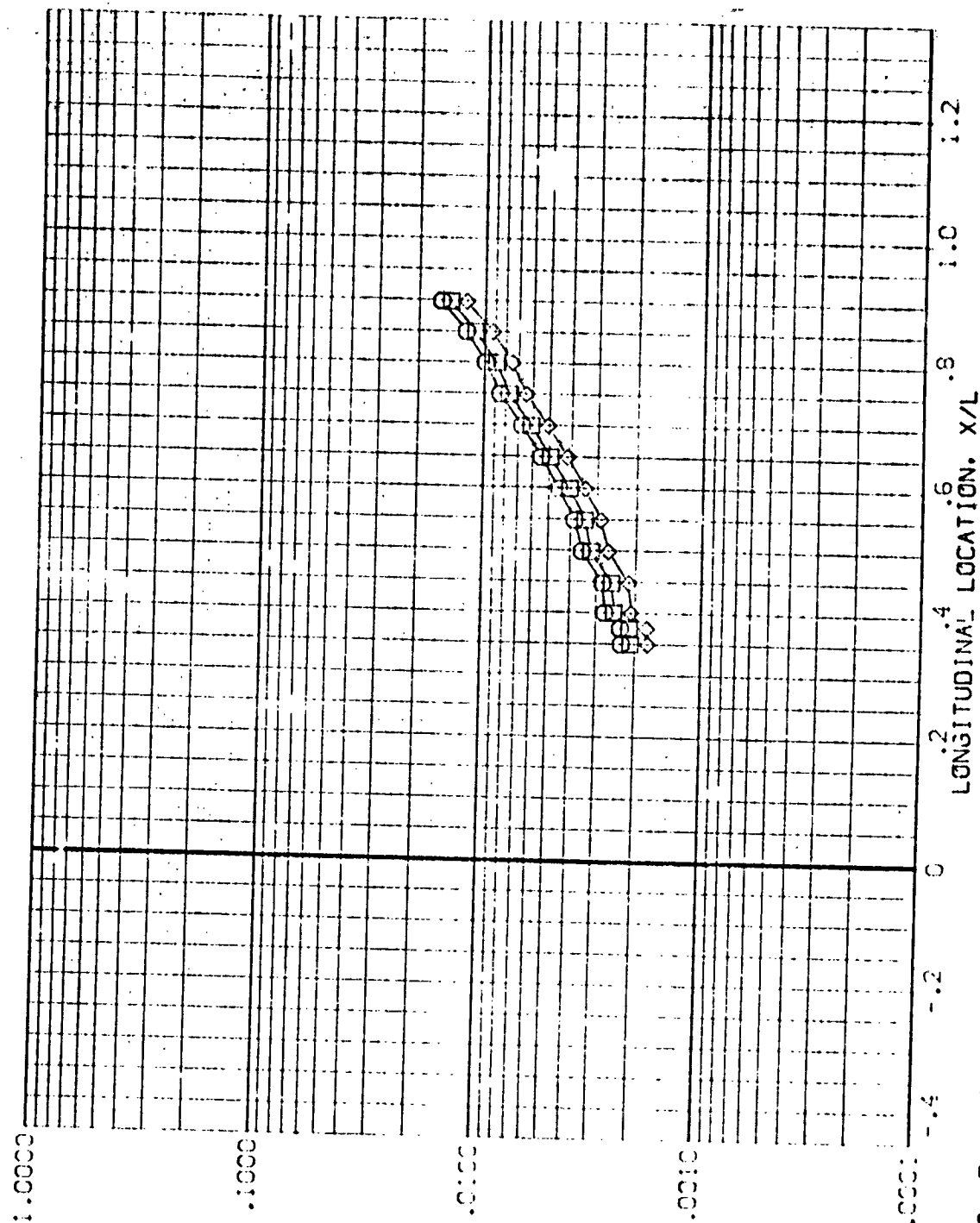


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 :H28 01+T1 EXTERNAL TANK

SYNOPSIS

DATE: 15-1-52

MACH 5.219

(PEVT12)

PARAMETRIC VALUES  
ALPHA 30.000  
BETA 1.000  
C/L -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

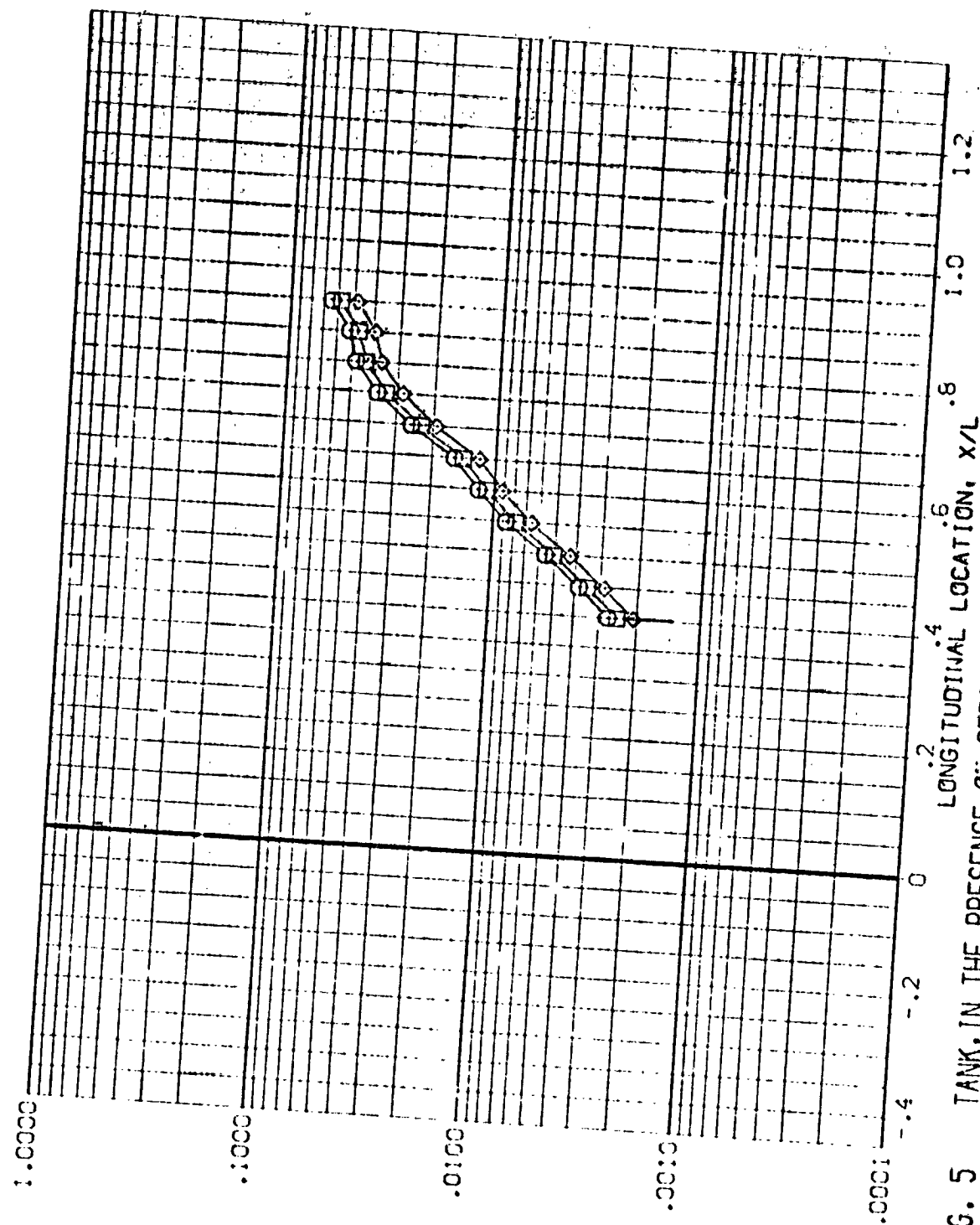


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AVES 3.5-:95 IH28 C1+T1 EXTERNAL TANK

(REV112)

SWRCL

HAZ/WT P-1 VACH  
 .850 150.000 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000 BETA -5.000  
 SVL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

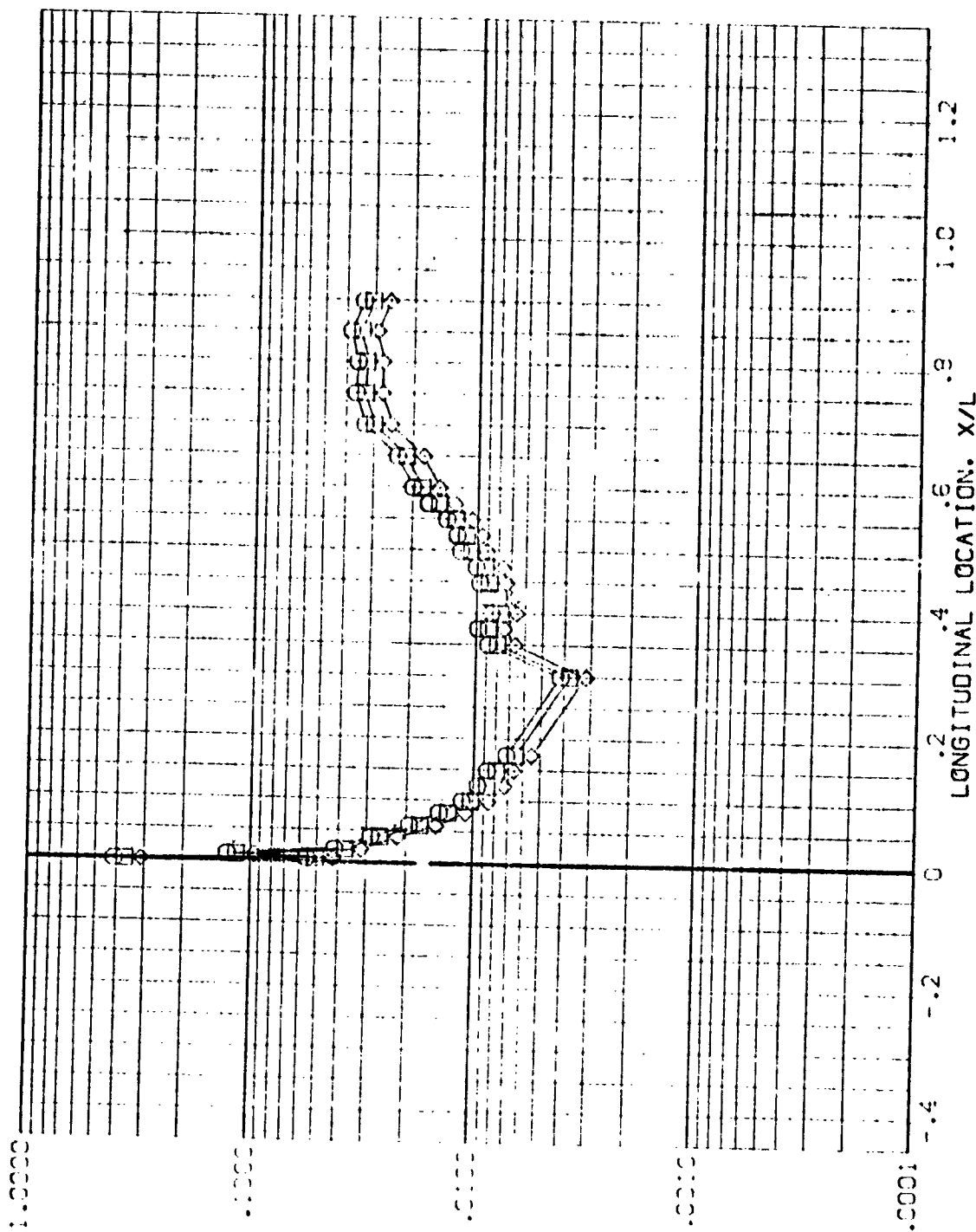


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-1:35 1428 01+T: EXTERNAL TANK

(REV101)

PARAMETRIC VALUES	ALPHA	BETA	
	.000	.000	.000
	RN/L	1.00	

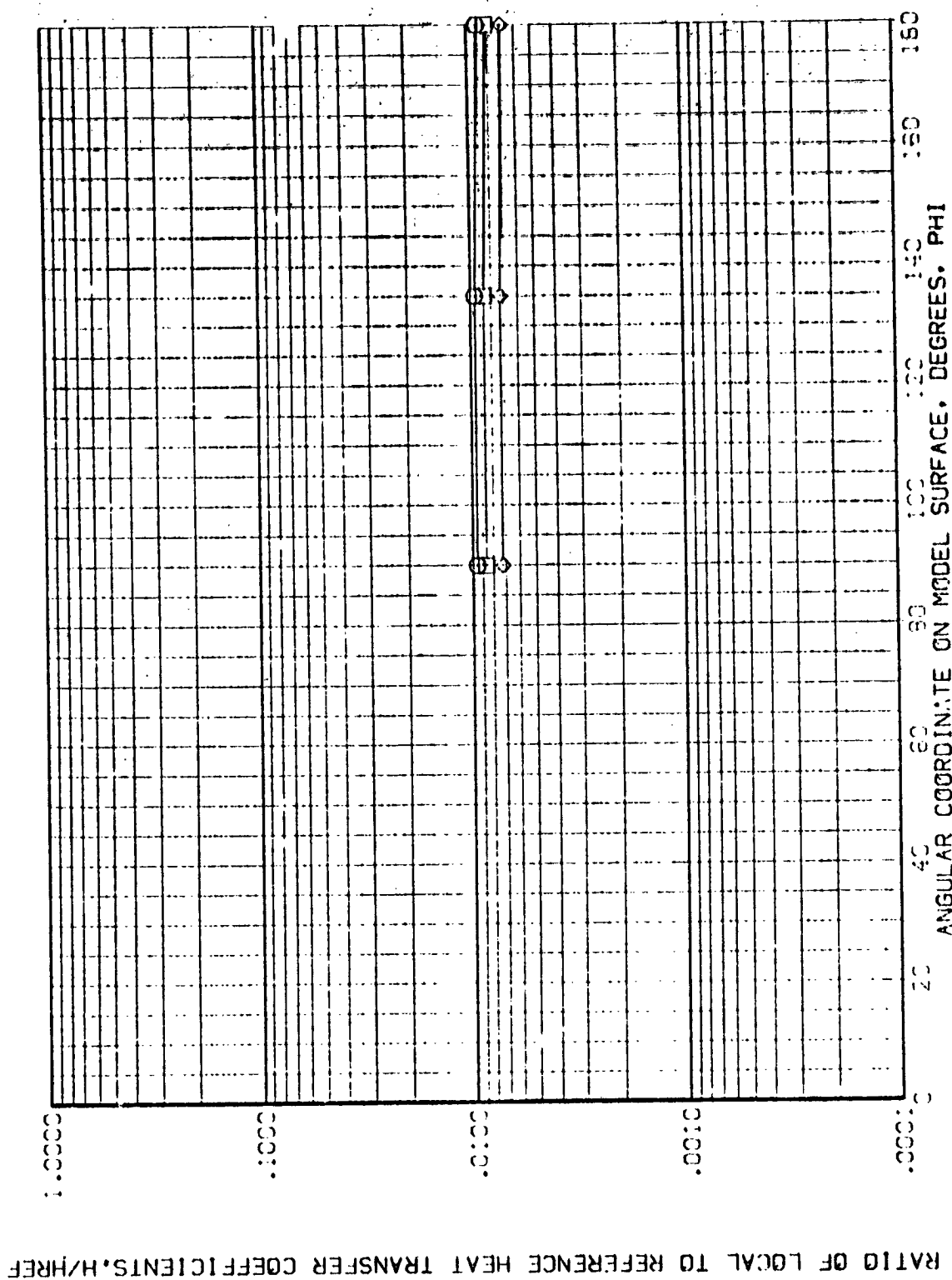


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV'TO1)

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .400 5.222  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 R/V/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

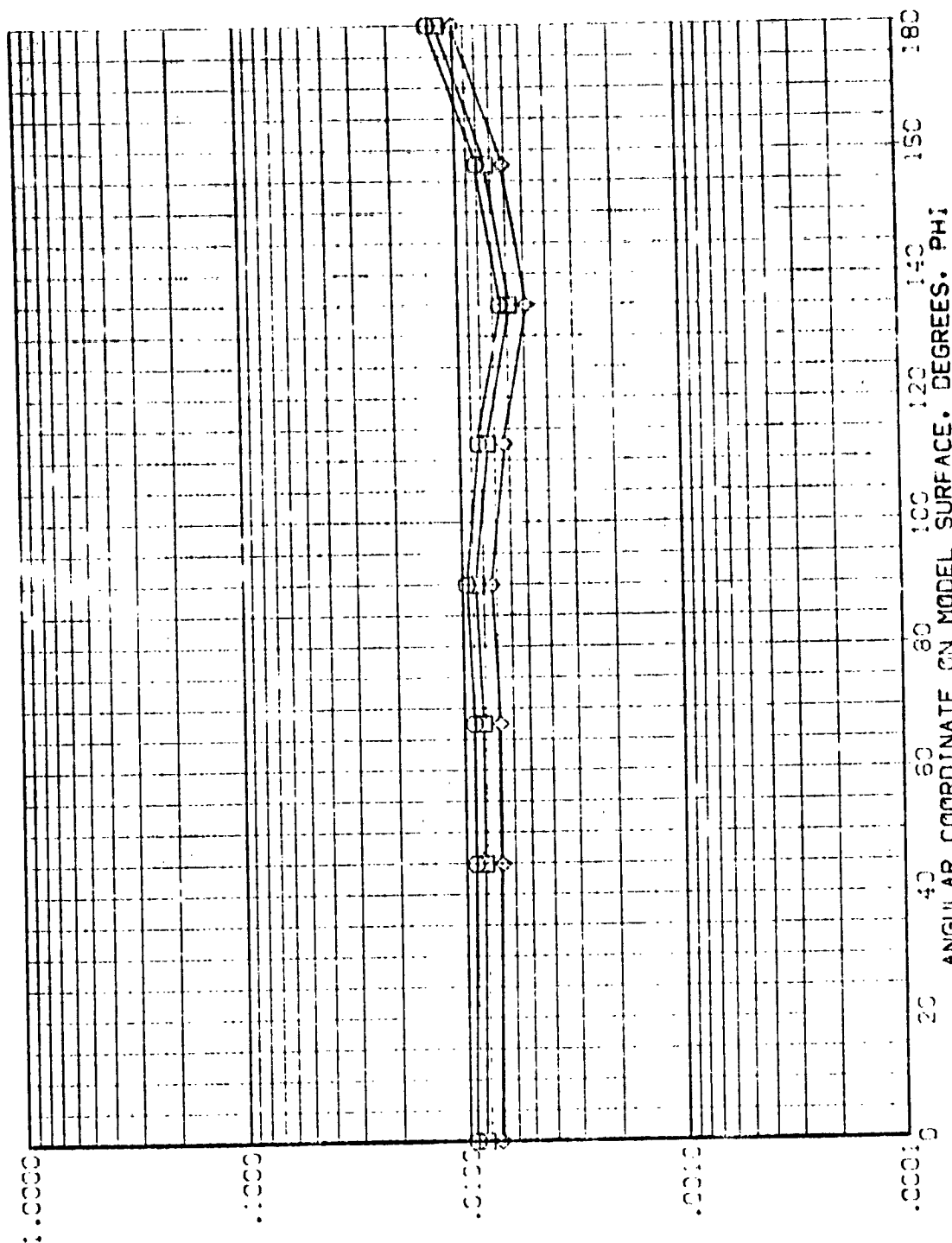


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REF: WDC JOURNAL, 1975  
 CHART NO. 1, PAGE 15

AMES 3.5-195 1428 01+T1 EXTERNAL TANK

(REV101)

SYMBOL HAW/H<sub>T</sub> V/L YAC<sub>4</sub>

.850 .450 5.222

ALPHA  
RN/L

PARAMETRIC VALUES  
.000 BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

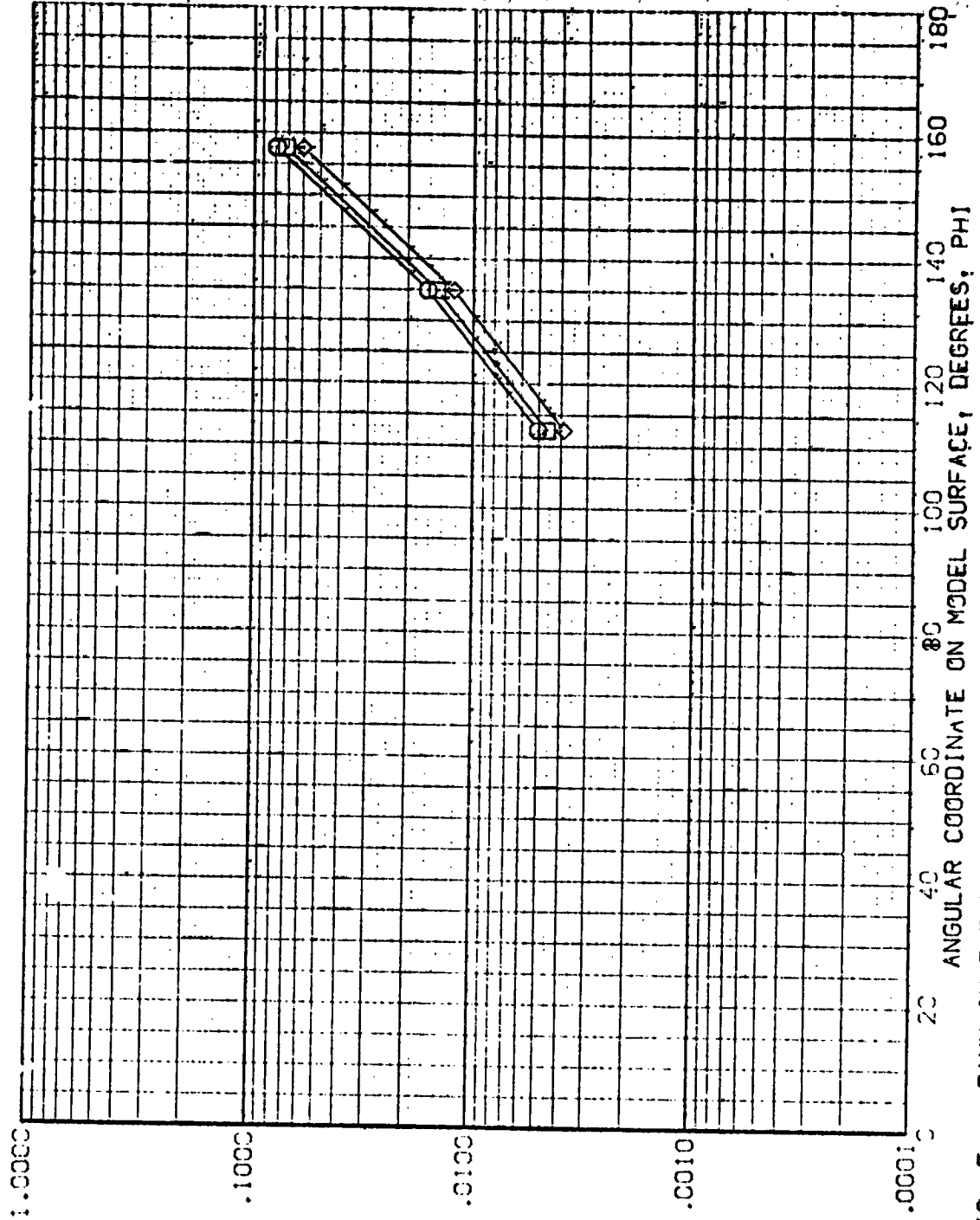


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL

MAV/HT  
.850  
.900  
1.000

X/L  
.500

MACH  
5.222

PARAMETRIC VALUES  
ALPHA  
RV/L

.000  
1.000  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

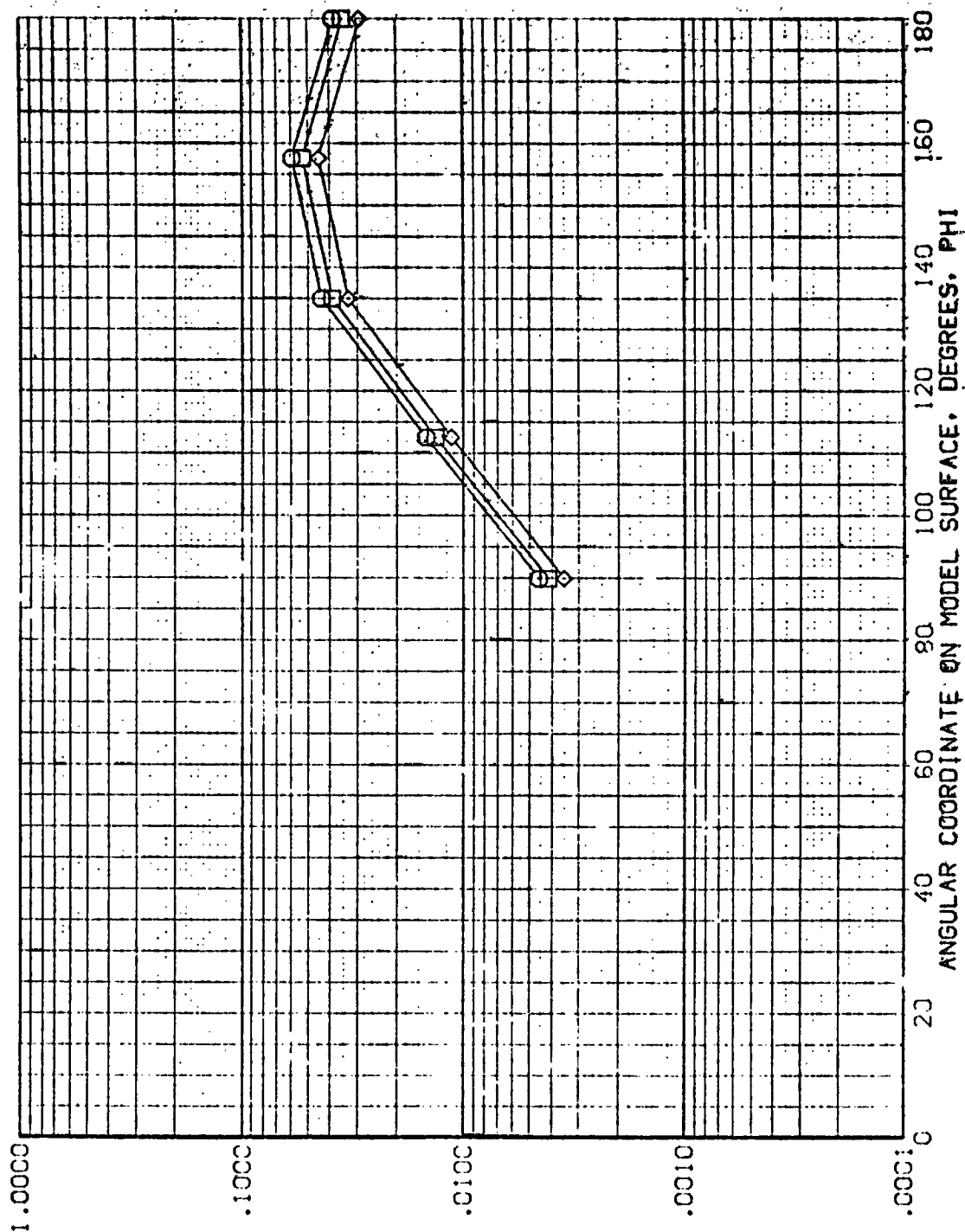


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T01)

SYMBOL H/W/HT X/L MACH  
 □ .850 .550 5.222  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 R/W/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

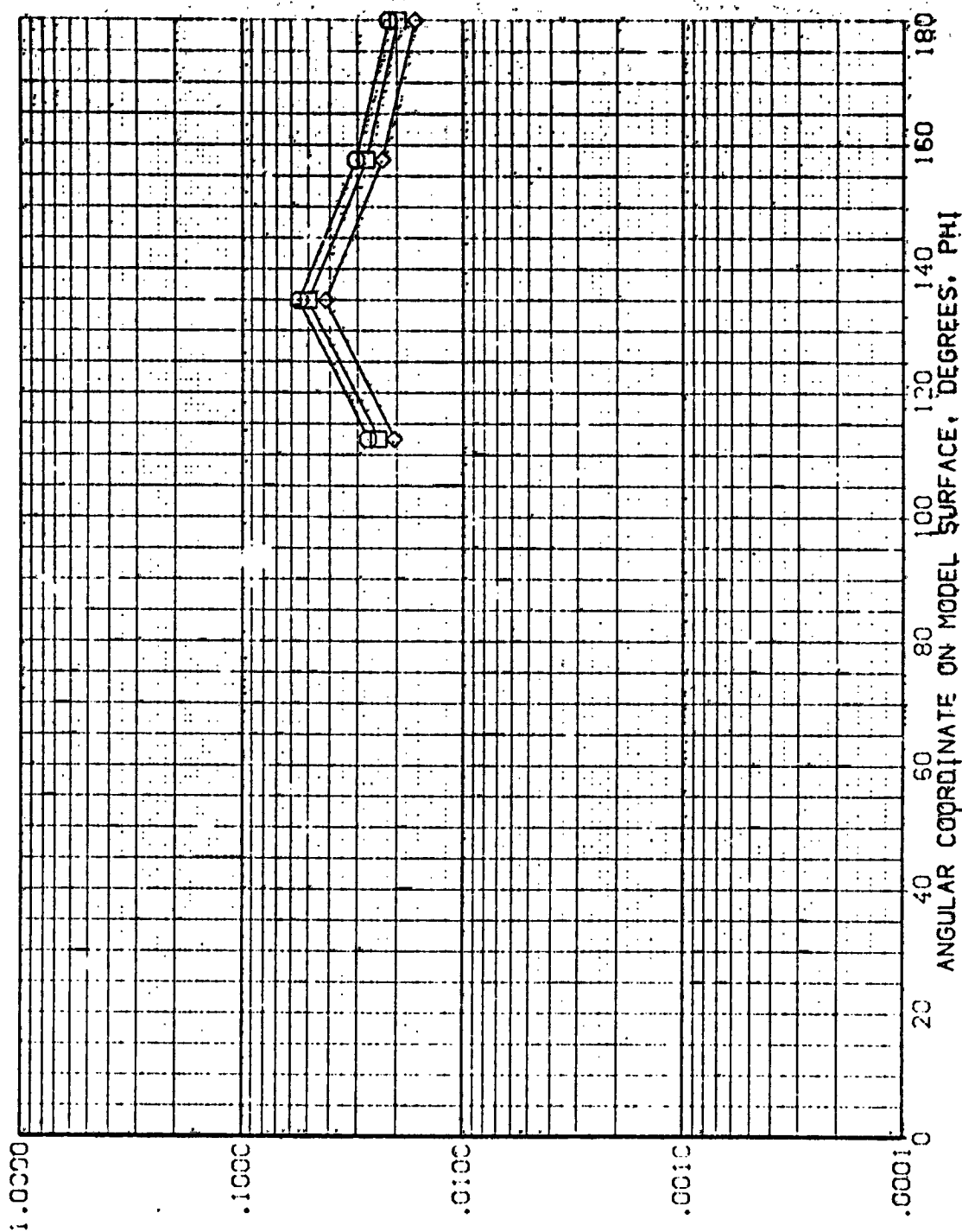


FIG. 5 TANK IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV101)

SYMBOLS:  $\square$   $\diamond$   
 WING/HT .850  
 X/L .600  
 MACH 5.222  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 BETA 1.30  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

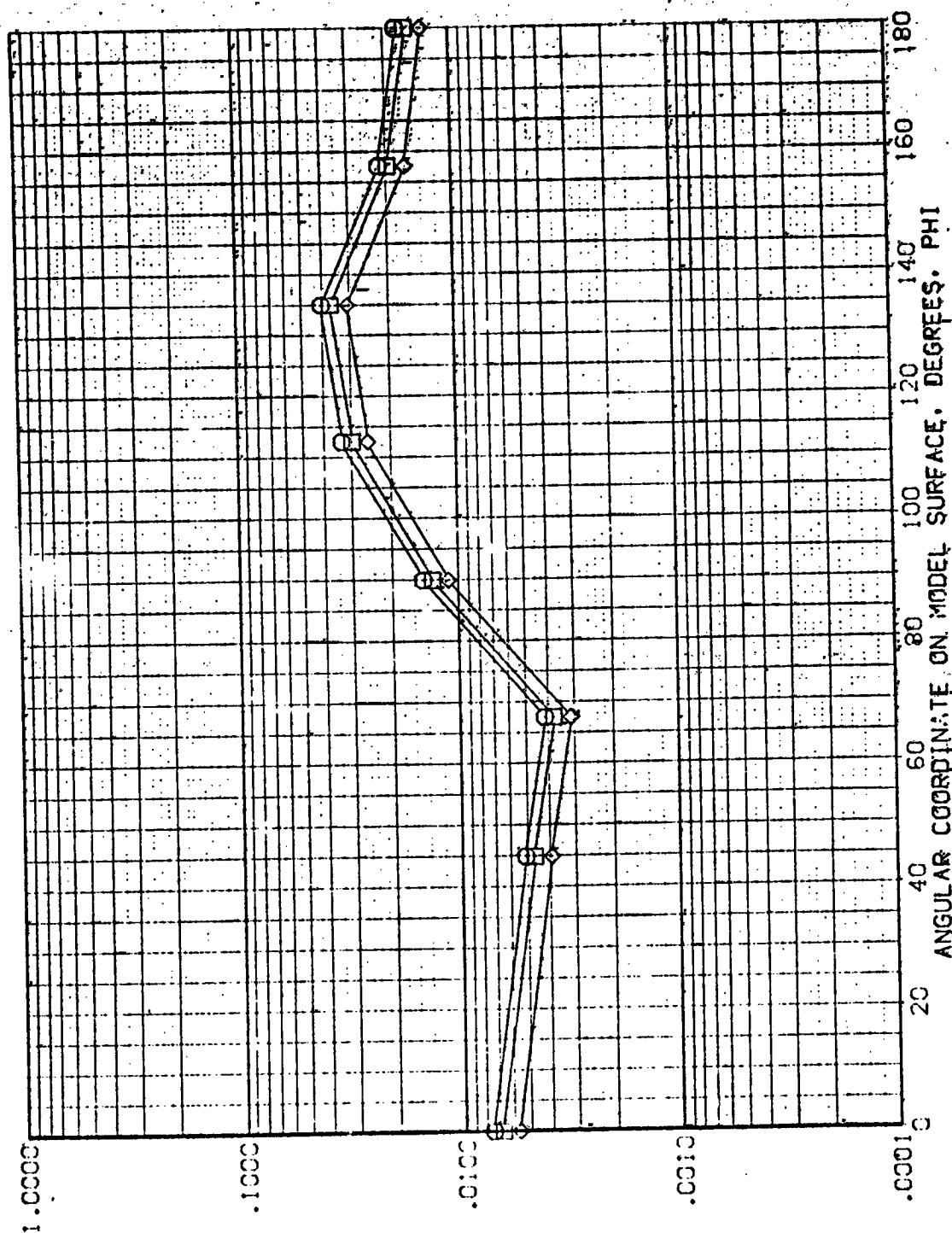


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV101)

SYNCH HAY/MT XAL MACH  
1850 .650 5.222  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 1.000  
RM/L 1.000  
BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

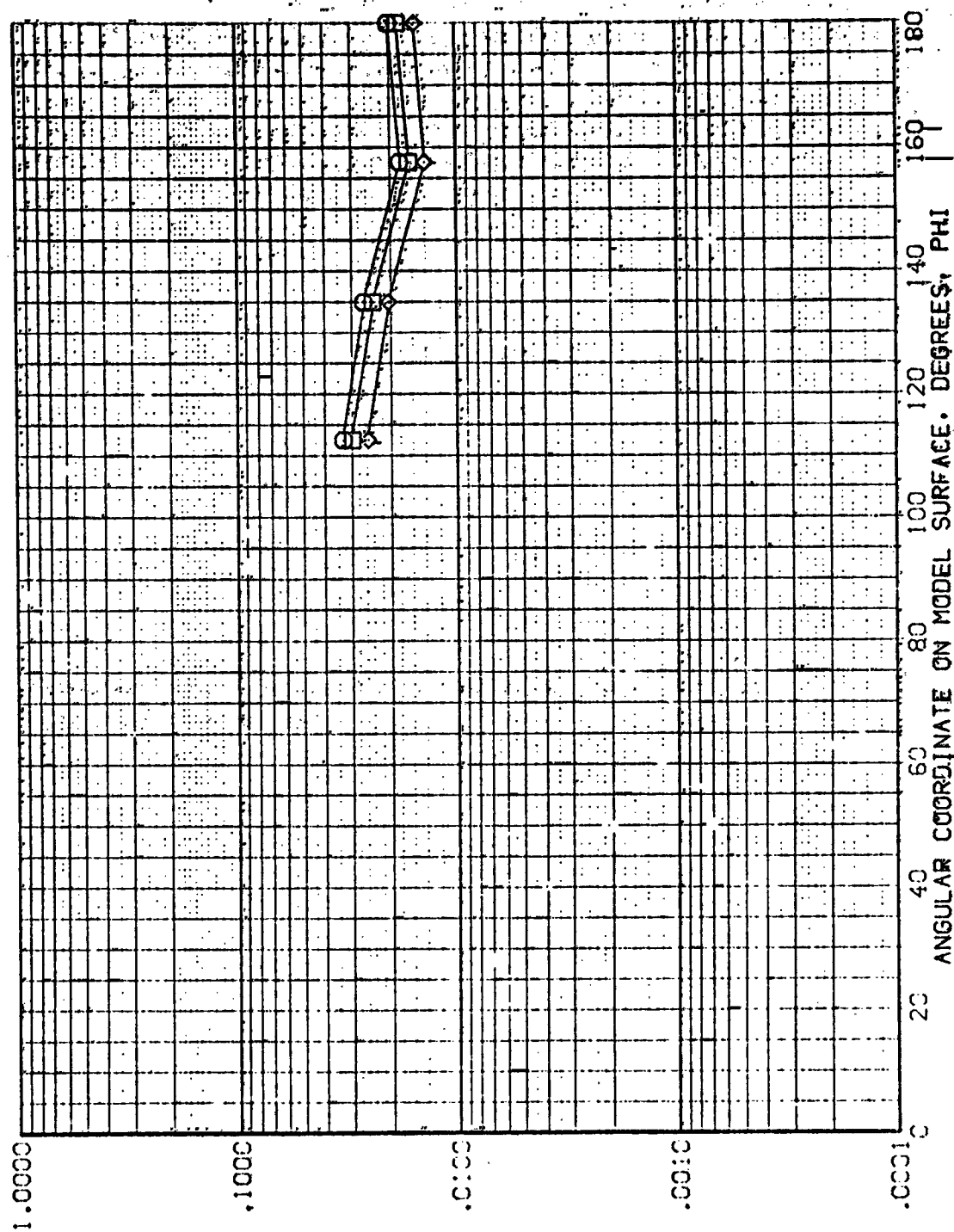


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK (REV101)

SYMBOL	HA/WHT	X/L	MACH	PARAMETRIC VALUES
◇	.850	.700	5.222	ALPHA .000
□	.900			BETA 1.000
◇	1.000			RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

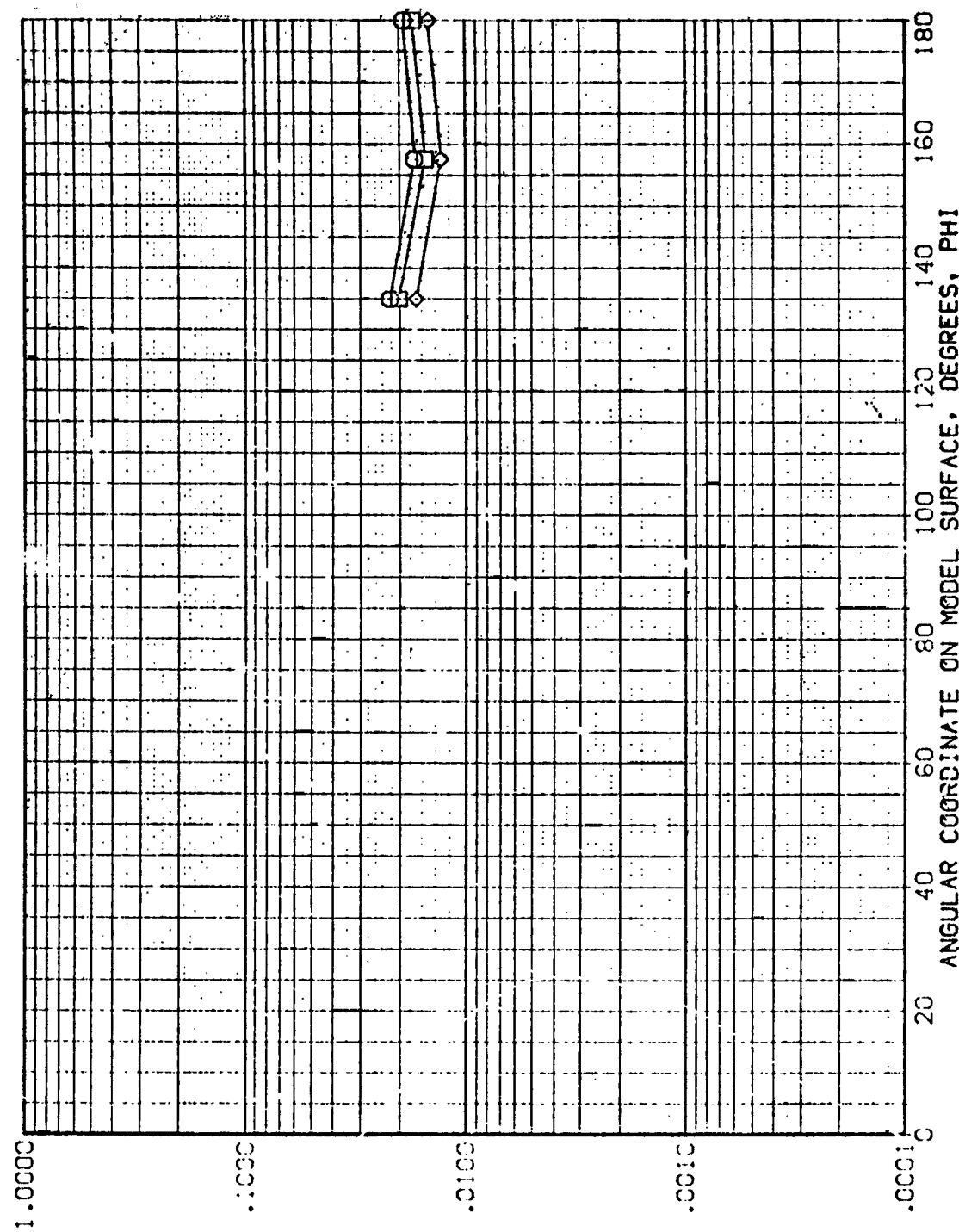


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T01)

SYMBOL  
 □  
 ◇

H/W/H  
 1850  
 .300  
 1.000

X/L  
 .750  
 MACH  
 5.222

PARAMETRIC VALUES  
 ALPHA  
 RNU  
 .000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

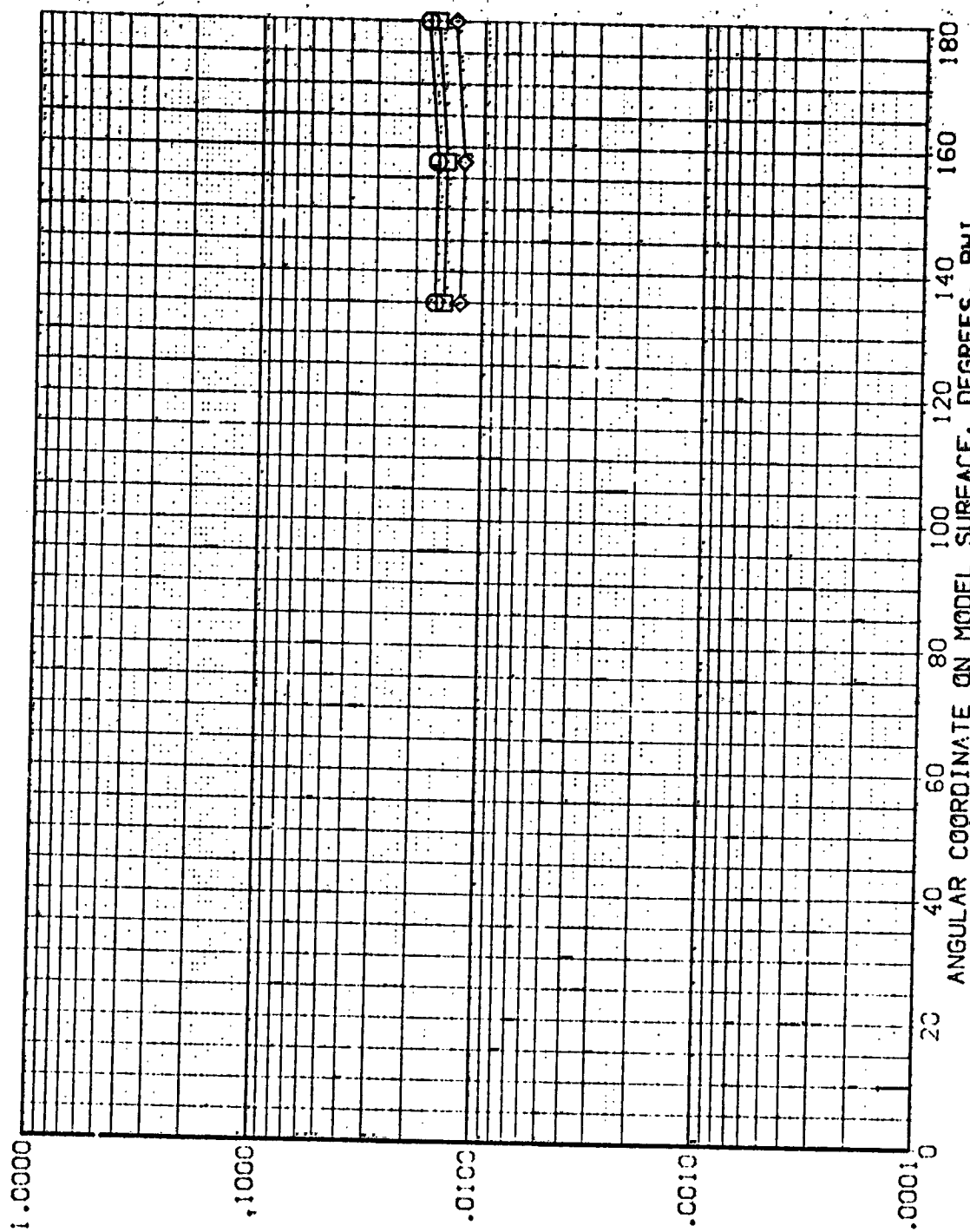


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  $\diamond$   $\square$

MAW/HT  
195C  
.900  
1.000

X/L  
.800

MACH  
5.222

PARAMETRIC VALUES  
ALPHA  
RMA/L  
.000  
1.000

.350

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

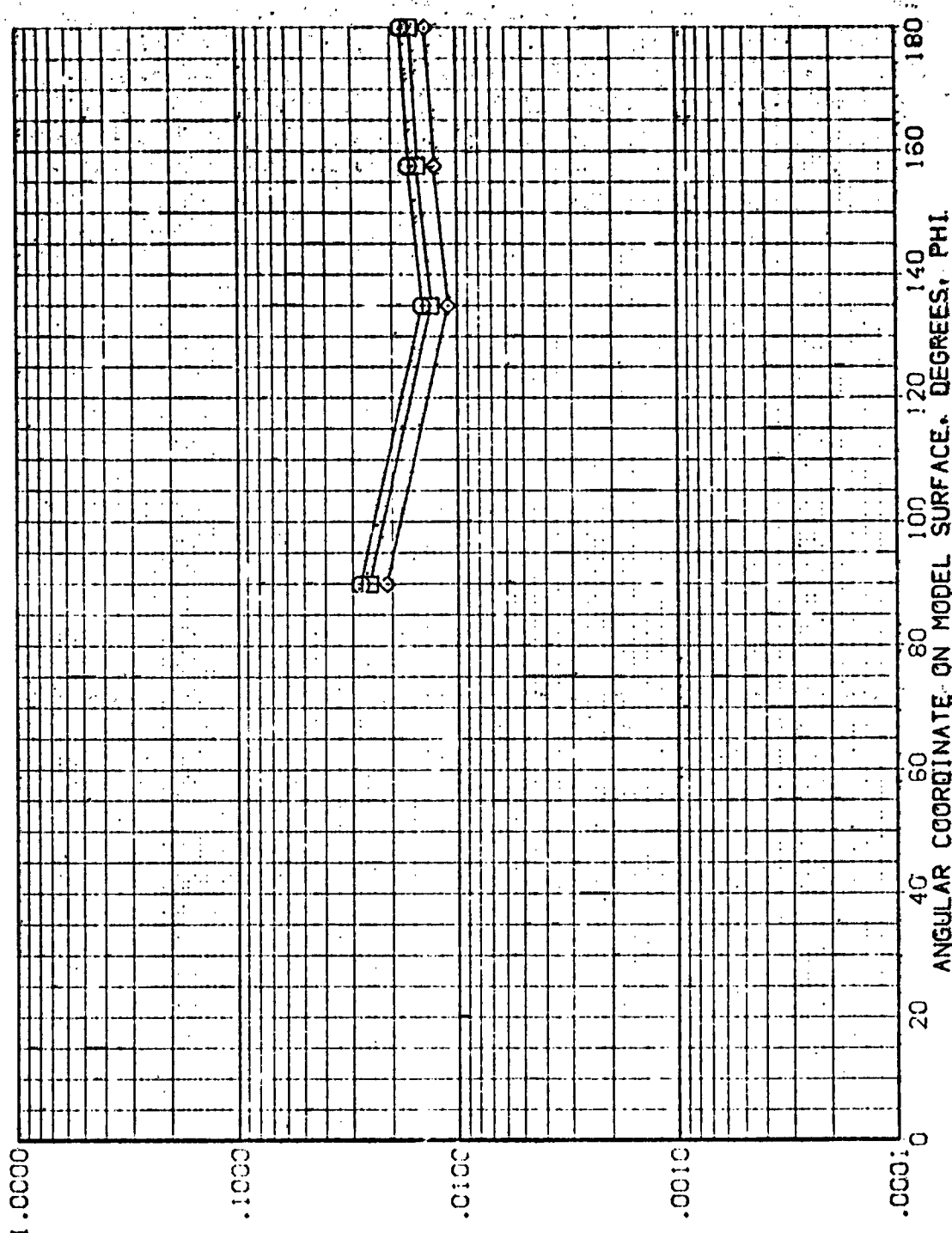


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REVISED)

0001  
000  
058  
11/11/11

X/L	5.222
YACH	5.222

PARAMETRIC VALUES

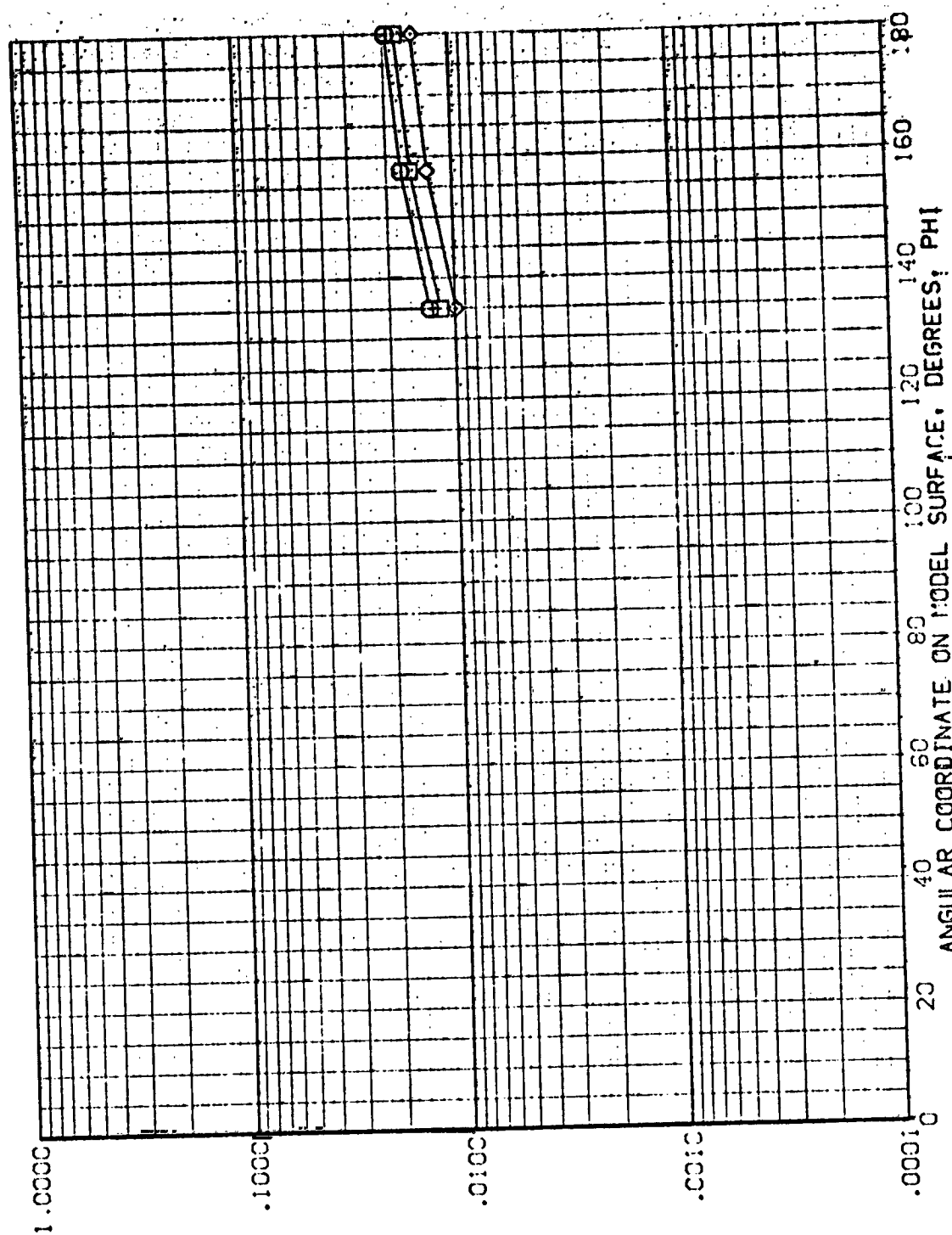
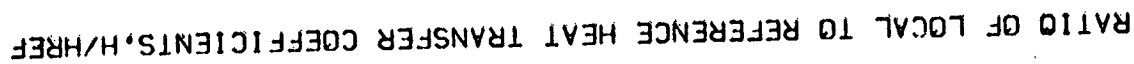


FIG. 5 TANK, IN THE PRESENCE OF CRBITER

SYMBOL

HAU/H<sup>+</sup>

X/L

MACH

ALPHA

BETA

RE/L

VALUES

.000

.000

.000

.000

.000

.000

.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

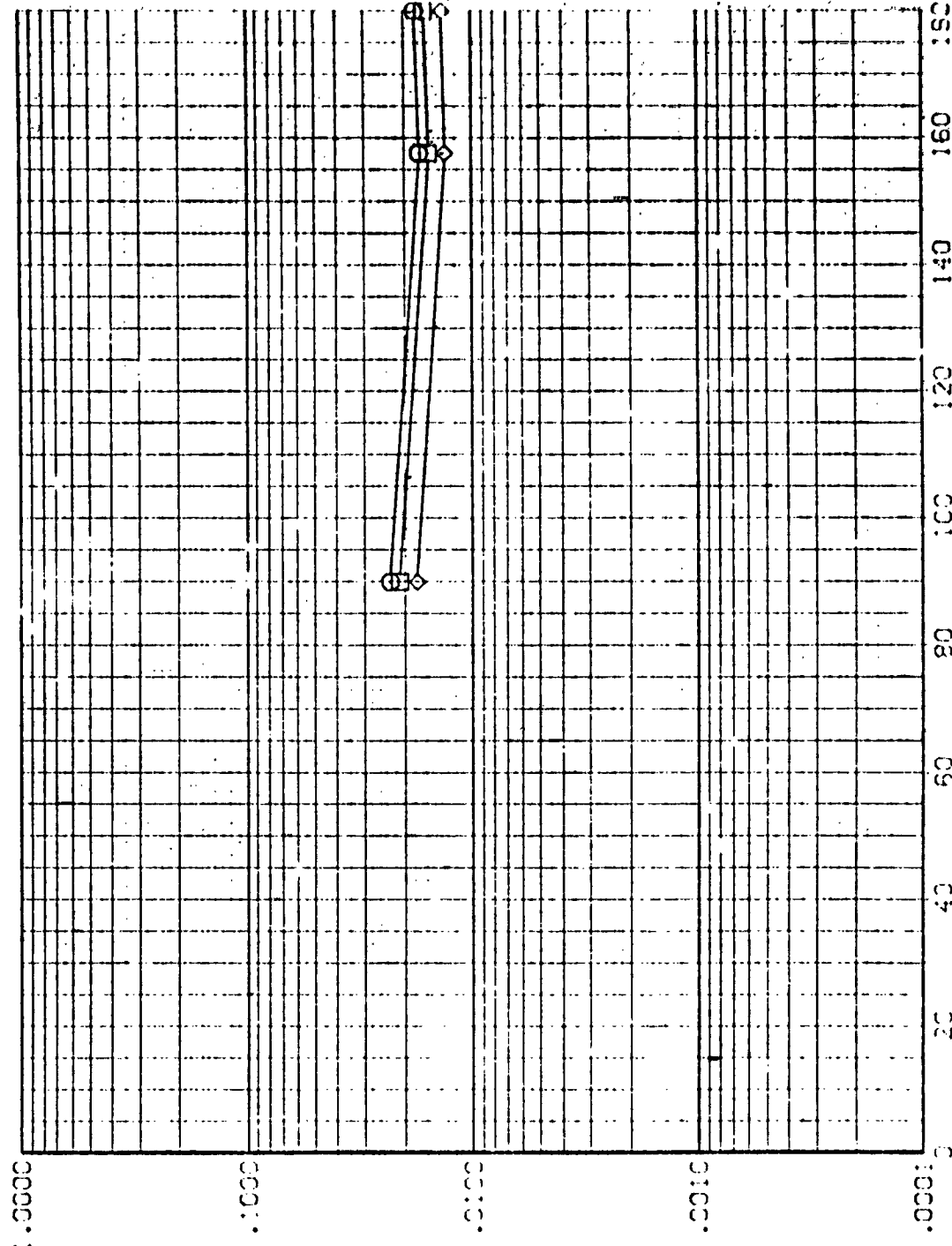


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 1429 01+T1 EXTERNAL TANK

(REV 02)

$\diamond$  S.W.E.C. HREF/HT X/L MACH  
 .850 .350 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 30.000 9E1A  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

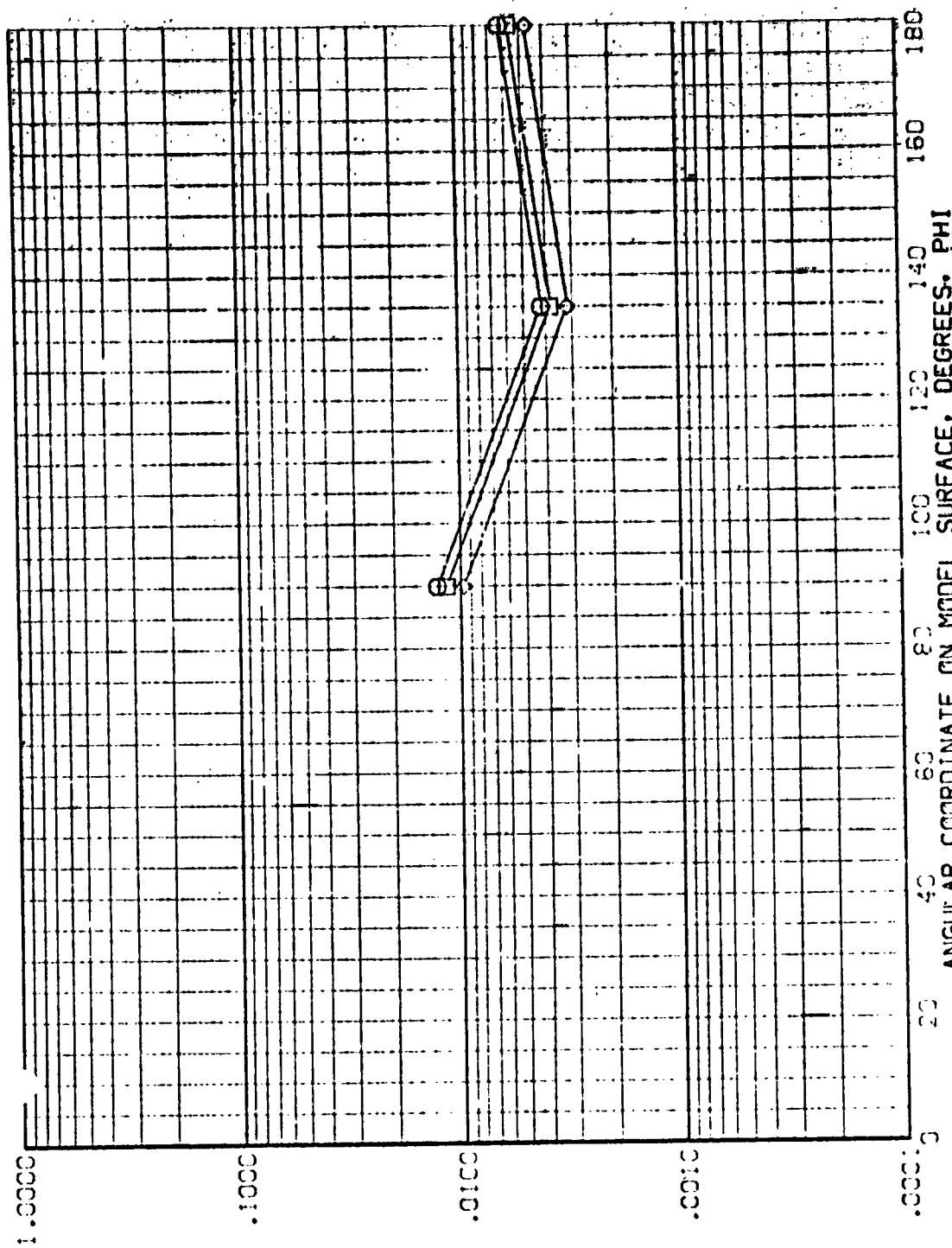


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV:02)

SECRET

1444/4	7.0	5.225	2.4 CH
1445	6.9	5.225	2.4 CH
1446	6.8	5.225	2.4 CH
1447	6.7	5.225	2.4 CH

PARAMETRIC VALUES	
ALPHA	30.000
BETA	1.000
PHI/L	.000

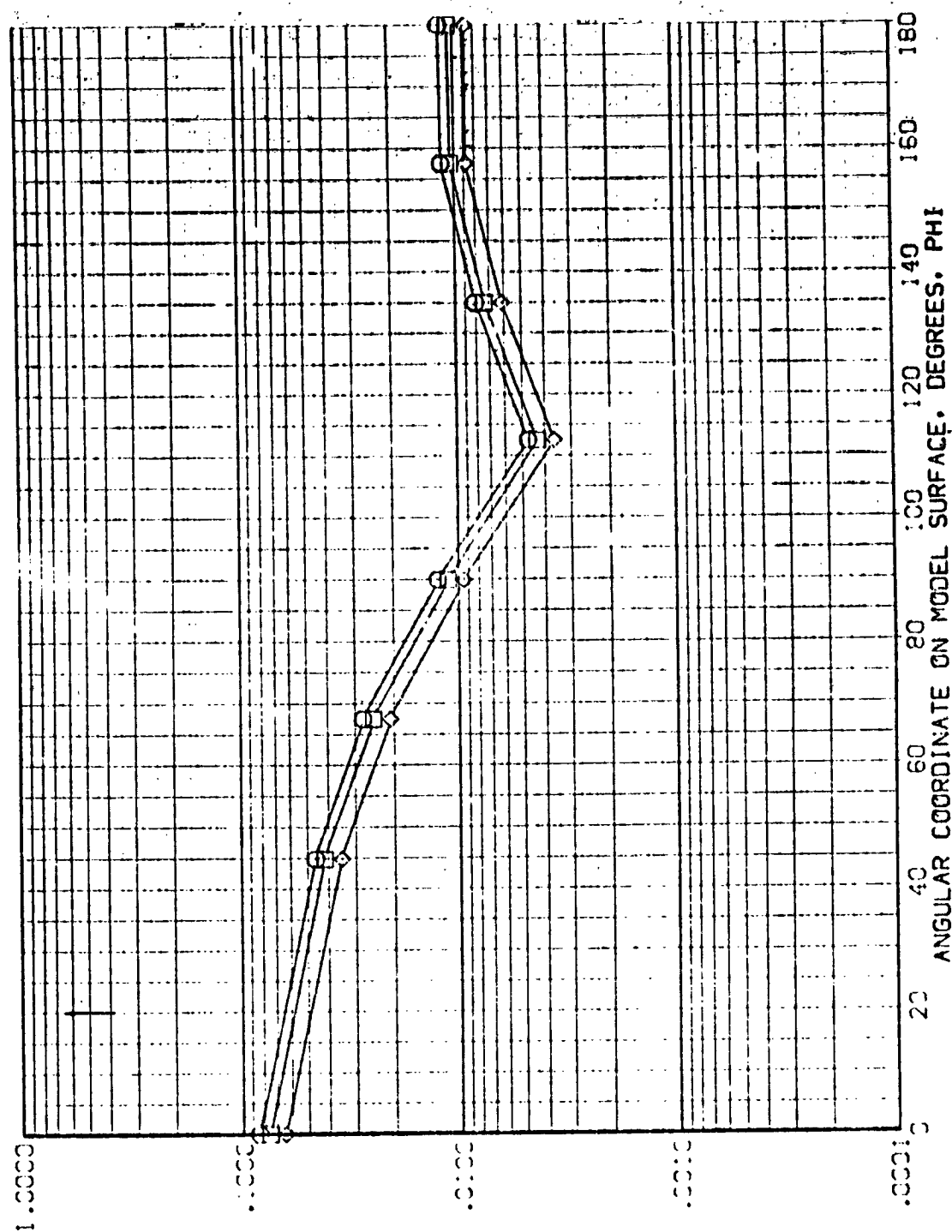
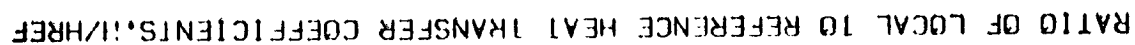


FIG. 5 TANK IN THE PRESENCE OF ORBITER

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FEDERAL RESERVE SYSTEM PAGE IS 100

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV702)

SYNOPSIS  
 H<sub>2</sub>/H<sub>2</sub>O  
 1850  
 1900  
 1950

X/L  
 .450

MACH  
 5.220

PARAMETRIC VALUES  
 ALP-A  
 PV/L  
 32.000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

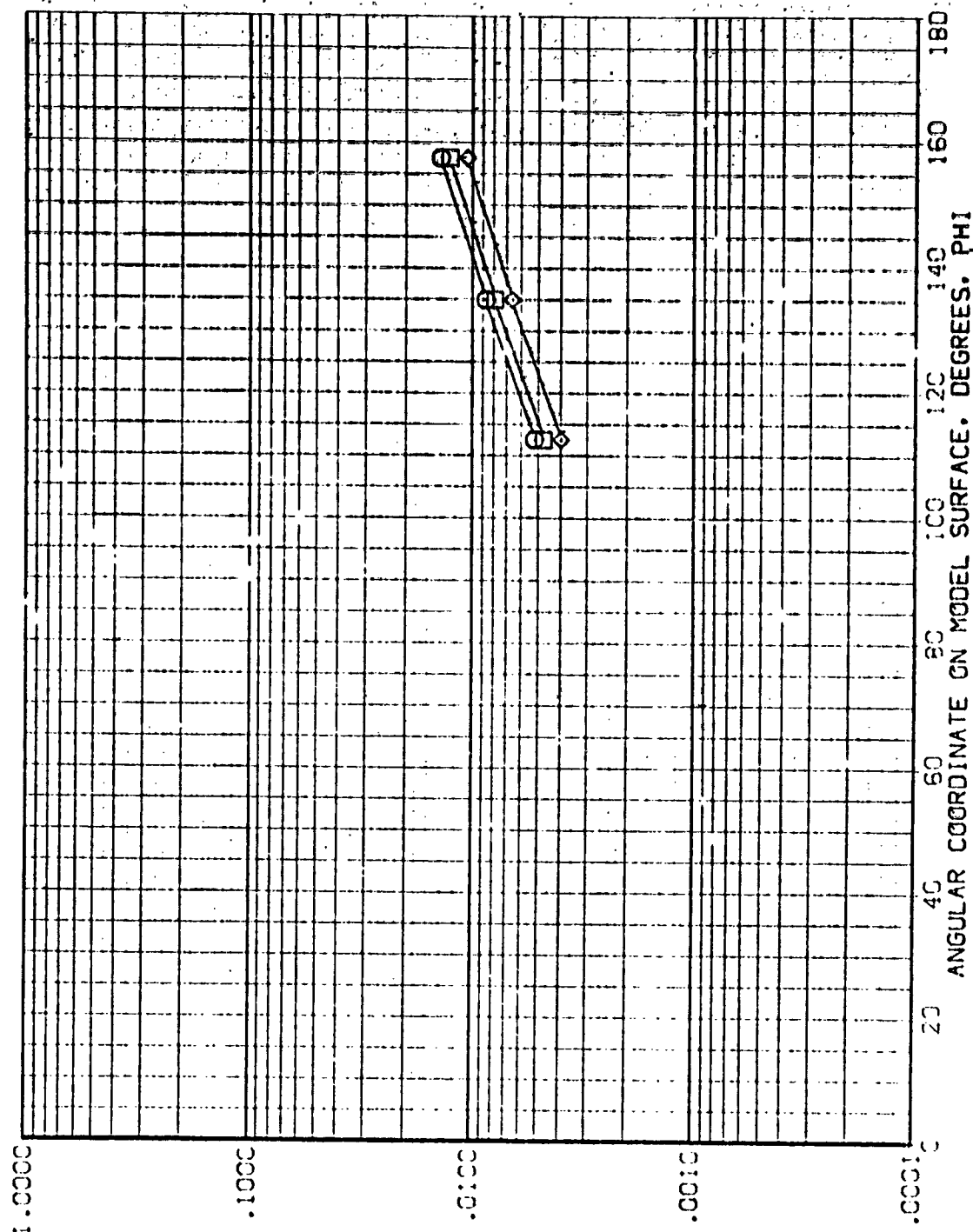


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



# AXES 3.5-195 IH28 G1+T1 EXTERNAL TANK

(REV102)

SYNCH. HAW/HT  
 .850  
 .900  
 1.000

K/L MACH  
 .500 5.220

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

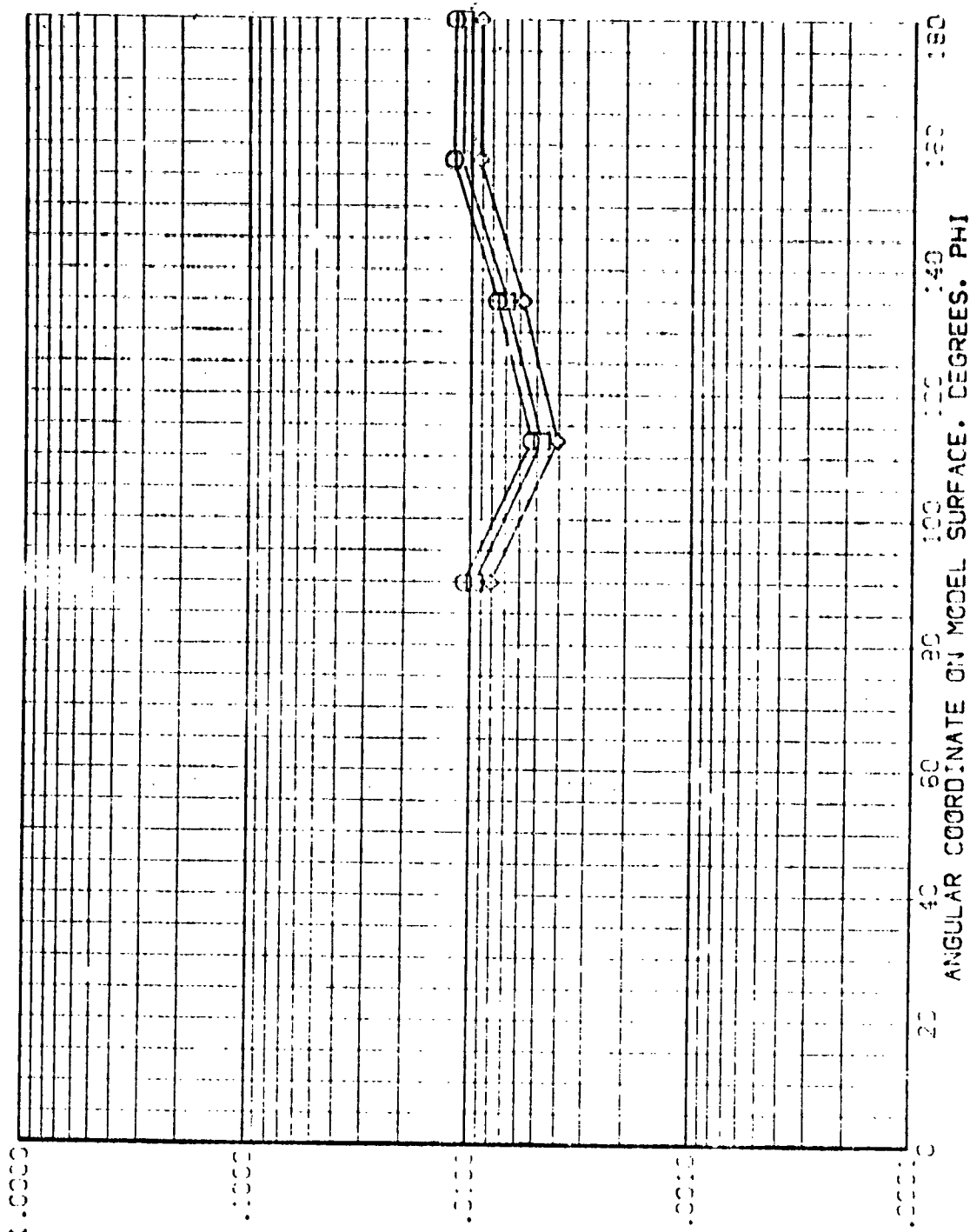


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T02)

PARAMETRIC VALUES  
 ALPHA 30.000 BETA 1.000  
 RI/L

SYMBOLS  
 V/L MACH  
 .850 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

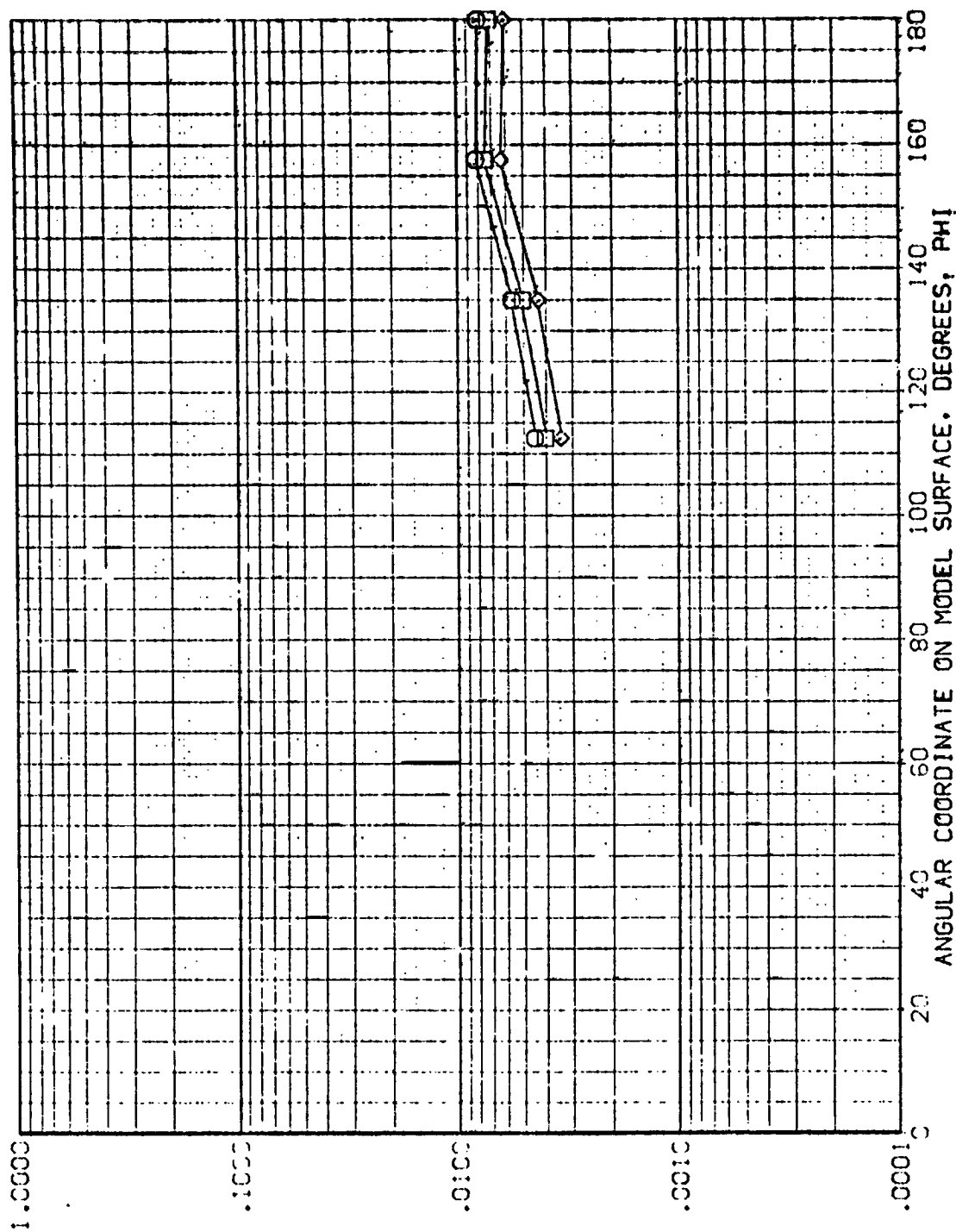


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3,5-195 1H28 01+T1 EXTERNAL TANK

(REV102)

SYMBOL H/W/H T X/L MACH  
 1.000  
 .850  
 .900

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

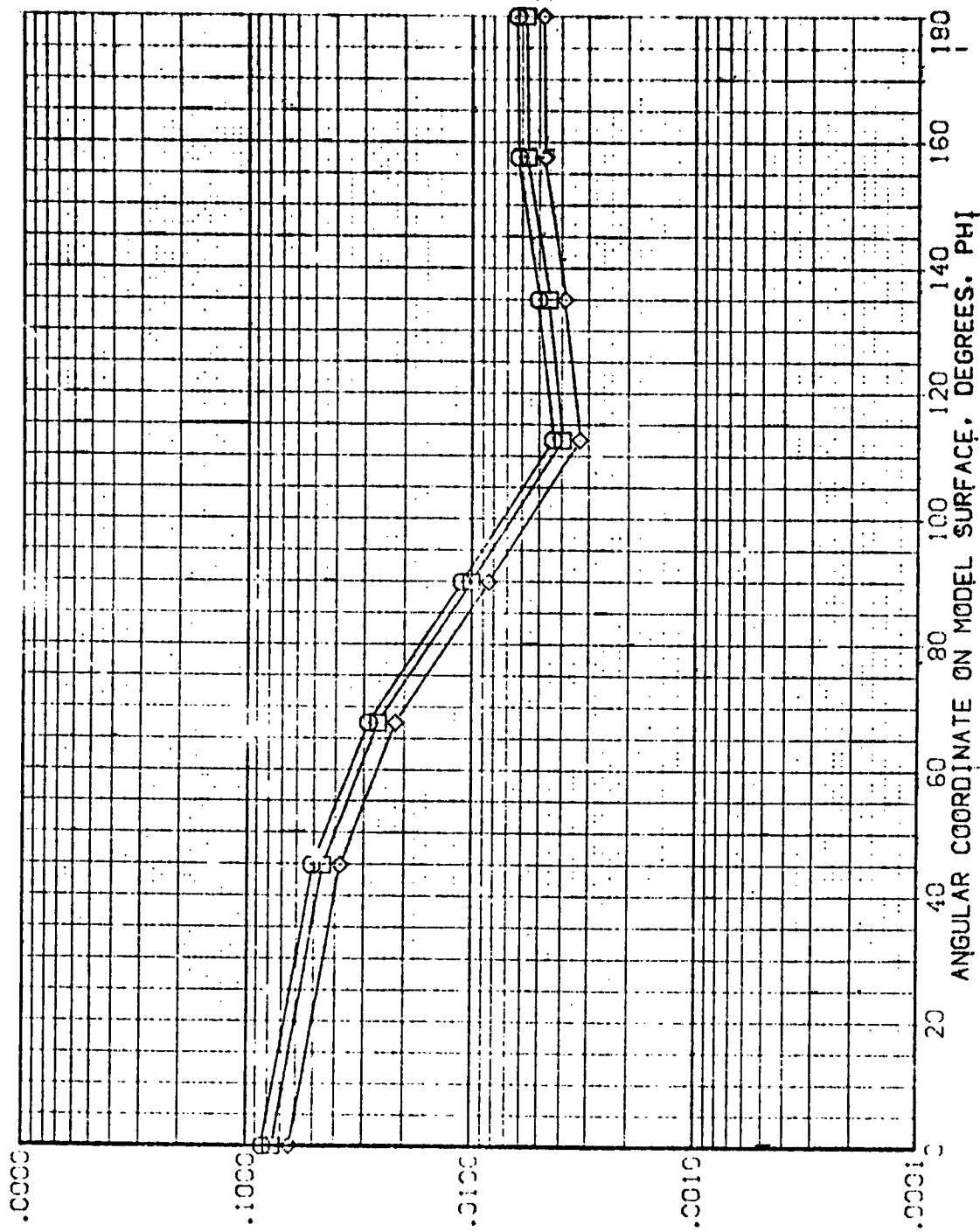


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV102)

SYMBOL	H/M/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
				RN/L	
◇	.850	.650	5.230	10,000	1,000
□	.900			1,000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

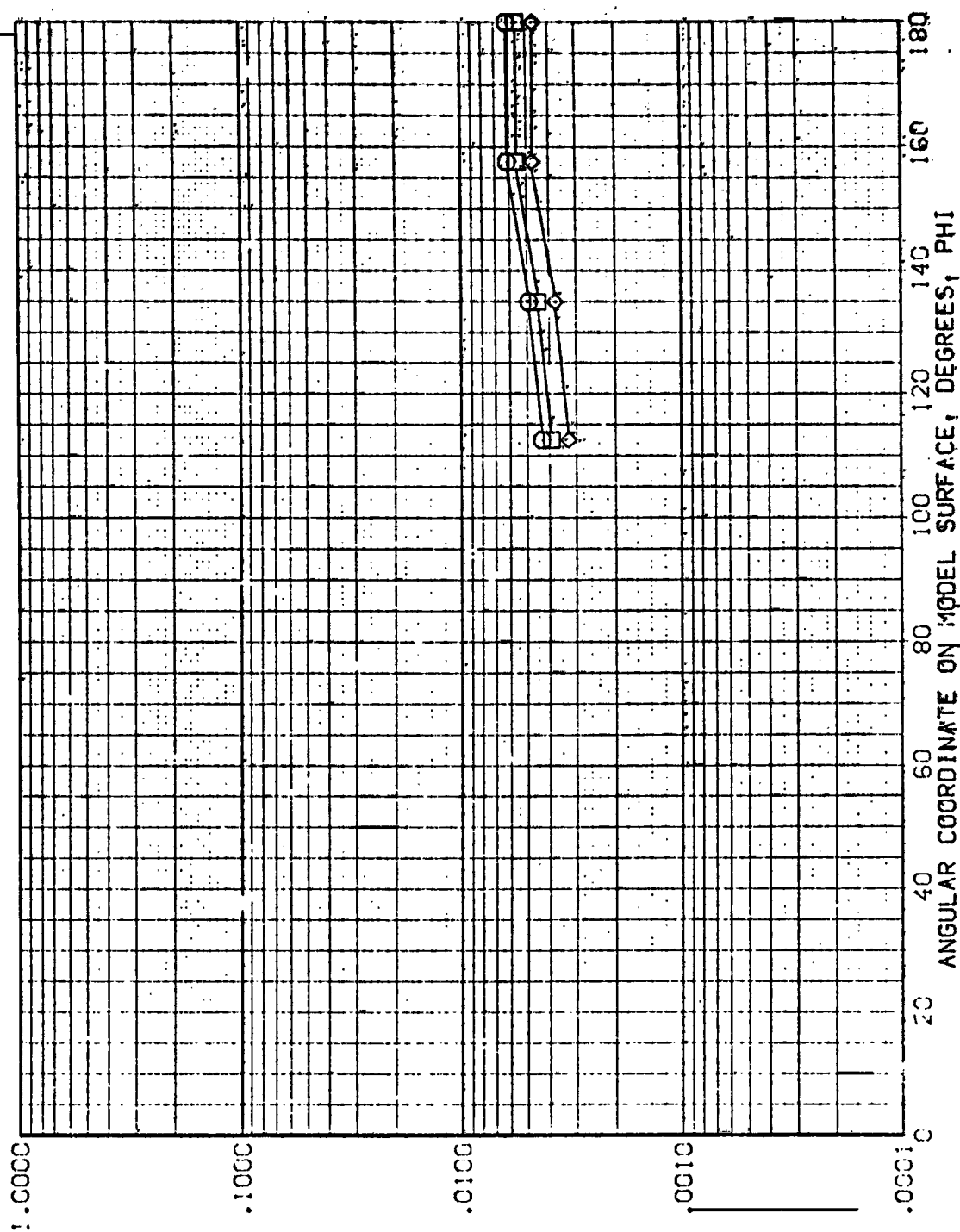


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV T02)

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

PARAMETRIC VALUES  
 ALPHA 30.000 BETA .000  
 RN/L 1.000

MACH 5.220  
 X/L .700

SYMBOL  
 ◇ □

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

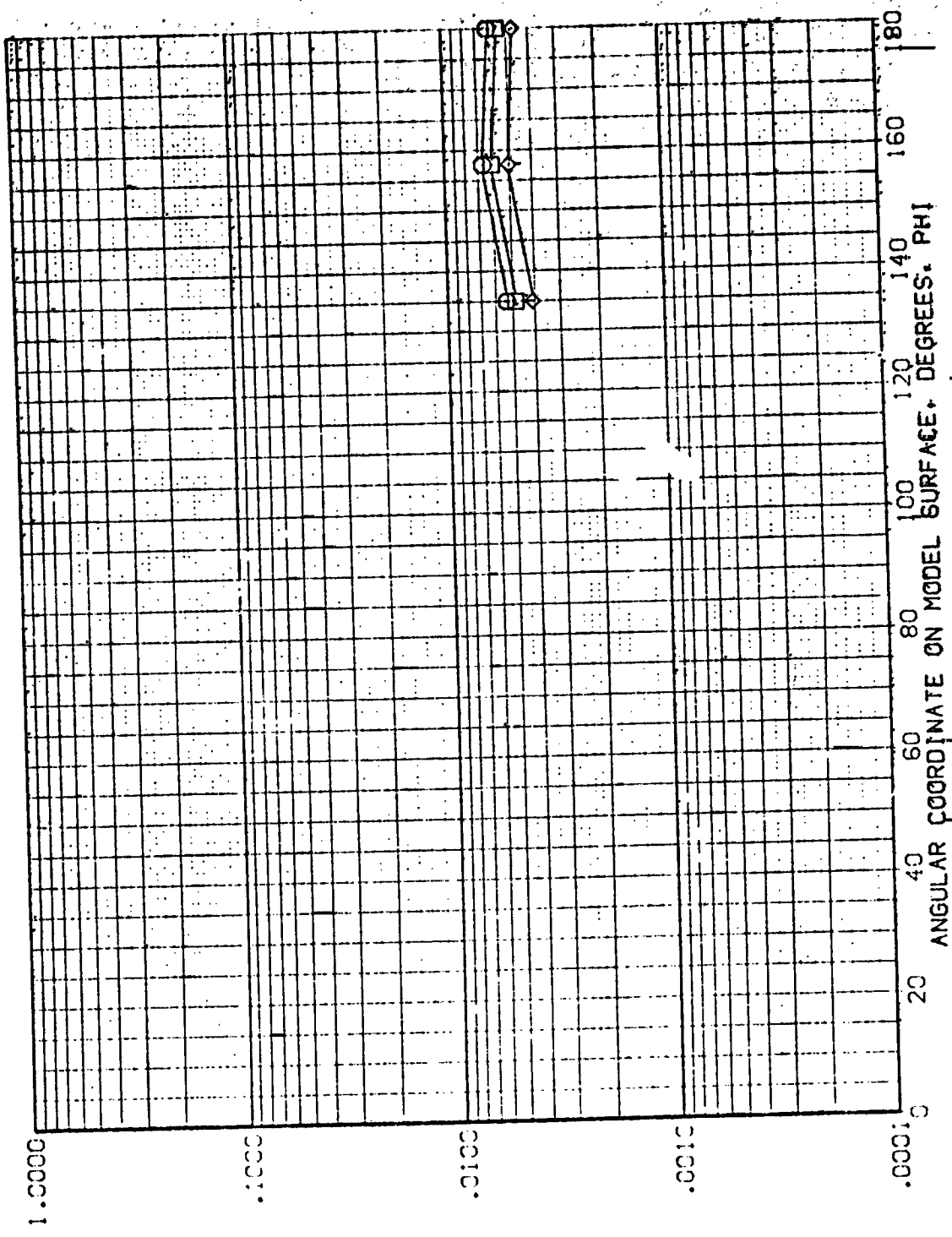


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 C1-T1 EXTERNAL TANK

(REV102)

SYMBOLS:  $\square$   $\diamond$

HAZ/WT 1/L MACH  
 .850 .750 5.220  
 .930  
 1.000

PARAMETRIC VALUES  
 A-PWA 30.008 BETA 1.080  
 RV/L

1000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

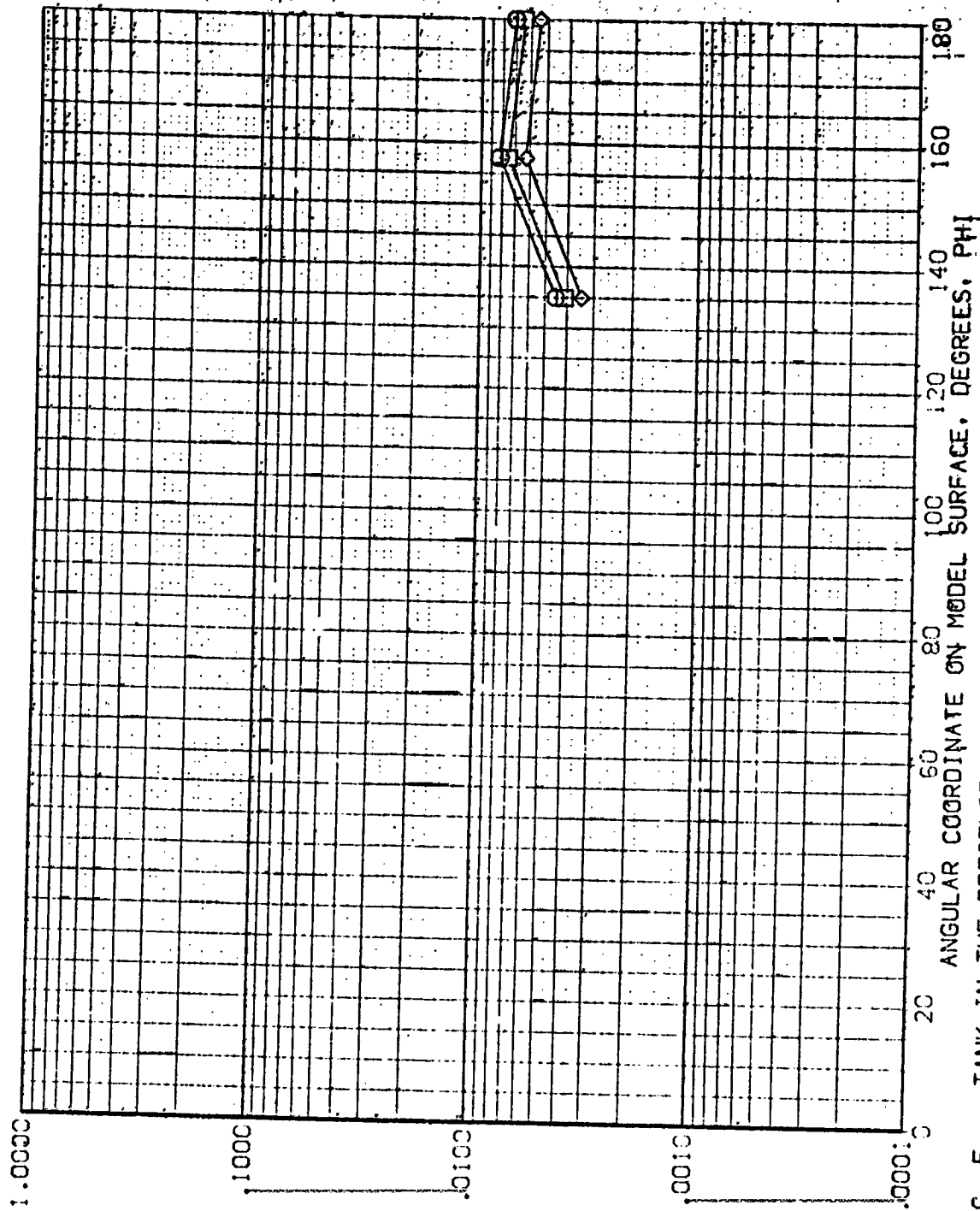


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AYES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV102)

SYMBOL

MAV/L  
1.000  
1.000  
1.000

MACH  
5.220

X/L  
.800

PARAMETRIC VALUES  
ALPHA  
RN/L  
30.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

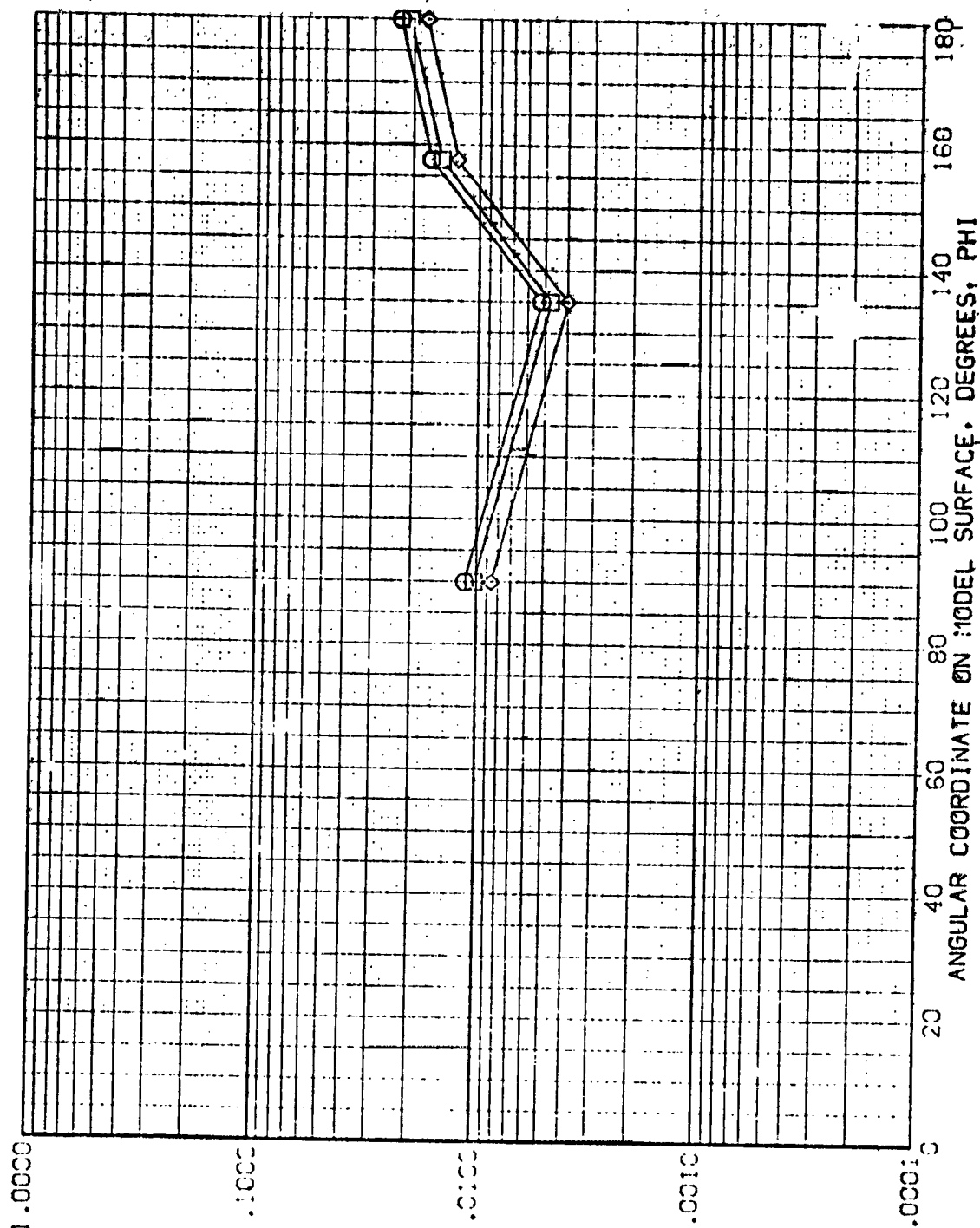


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV102)

1-1-1

**EACH**

— EACH

100  
100/100

11

ACH

## PIEZOMETRIC VALUES

ALPHA  
REV/L

1. 1000

880

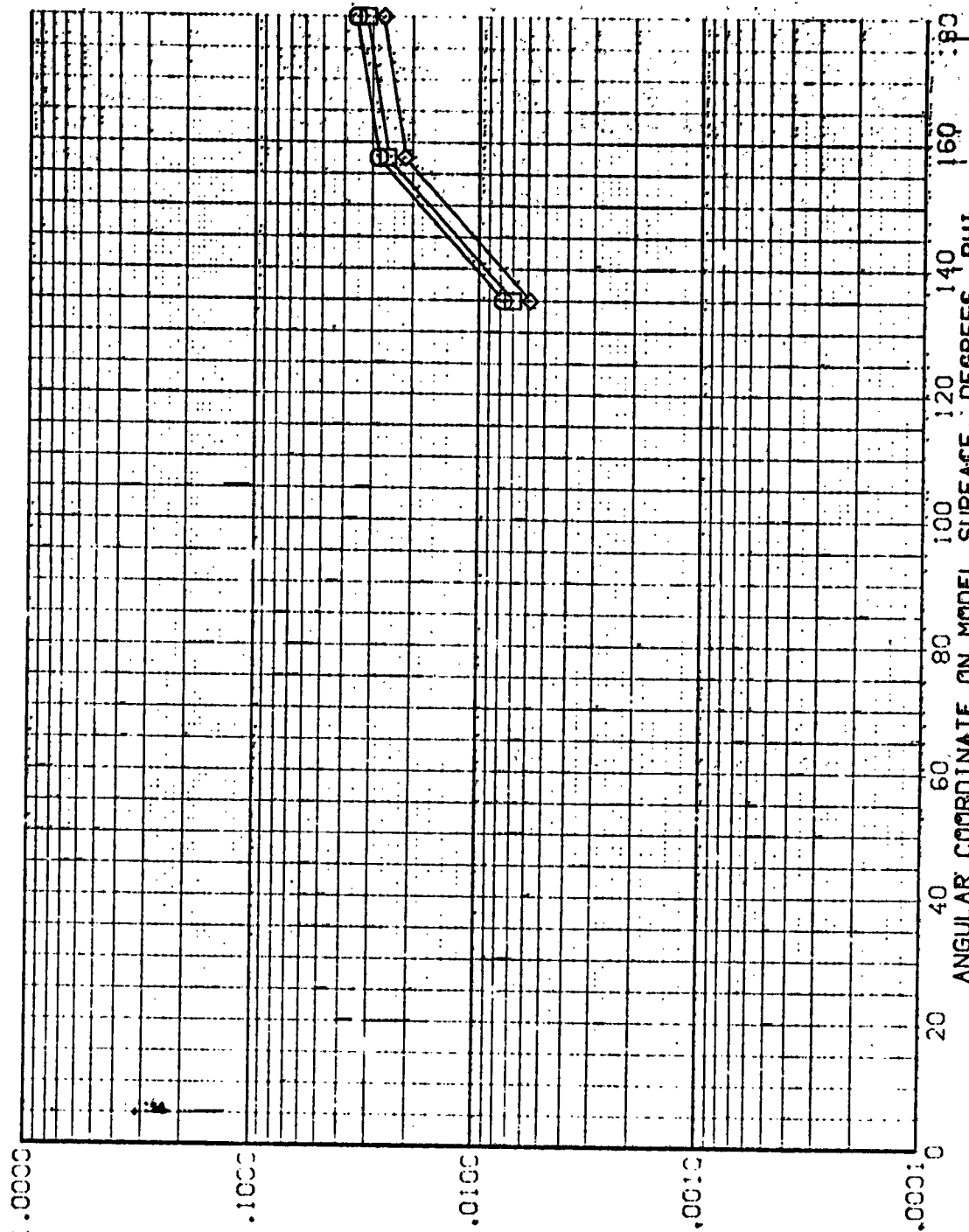
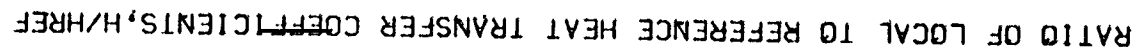


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV102)

SYMBOL

MAV/HT  
.850  
.900  
1.000

X/L  
.900

MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
RN/L  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

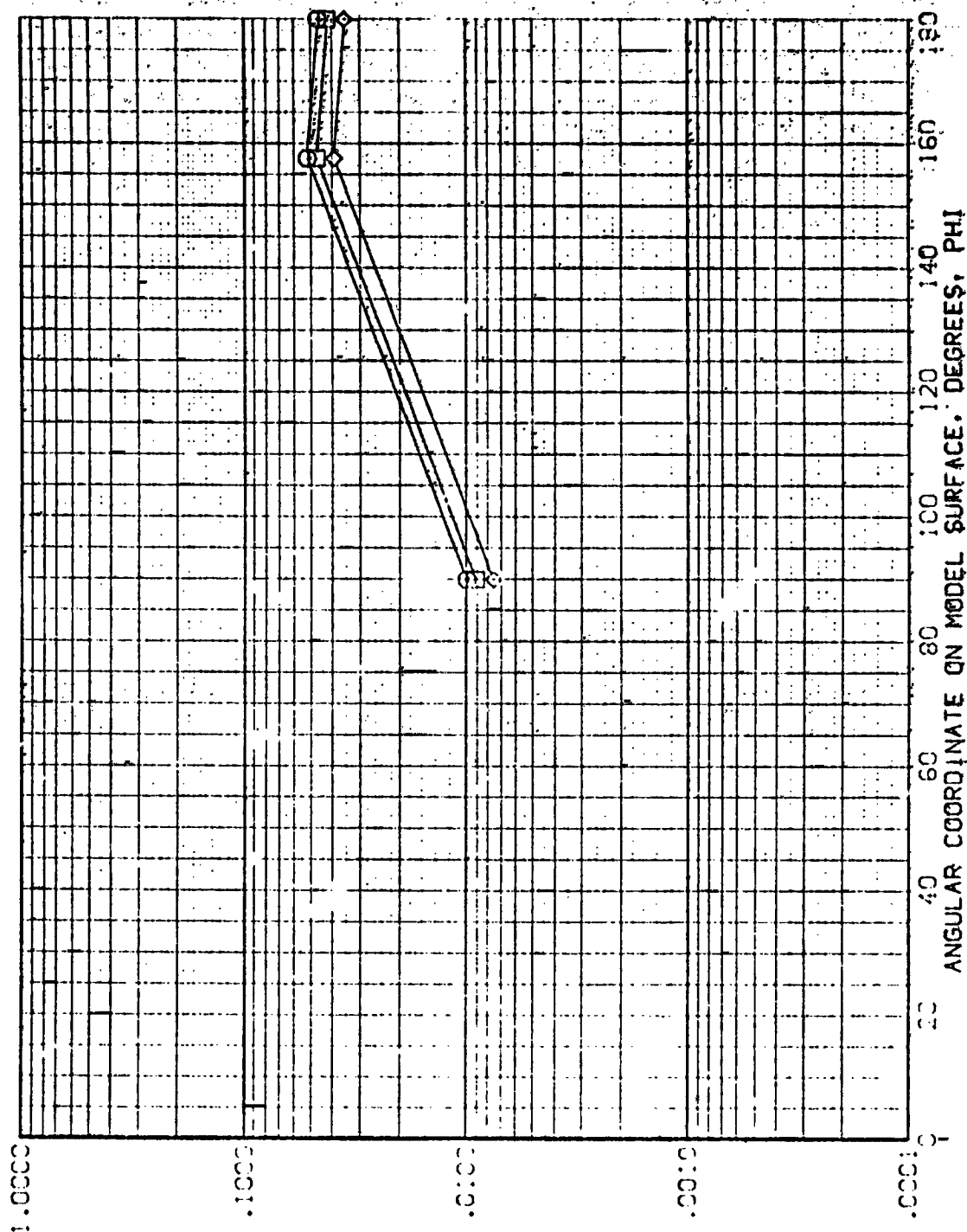


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AXES 3,5-195 1H28 01+T1 EXTERNAL TANK

(REV T03)

SYMBOL H/W/T Y/L MACH  
 1.850 .350 5.220  
 .200  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

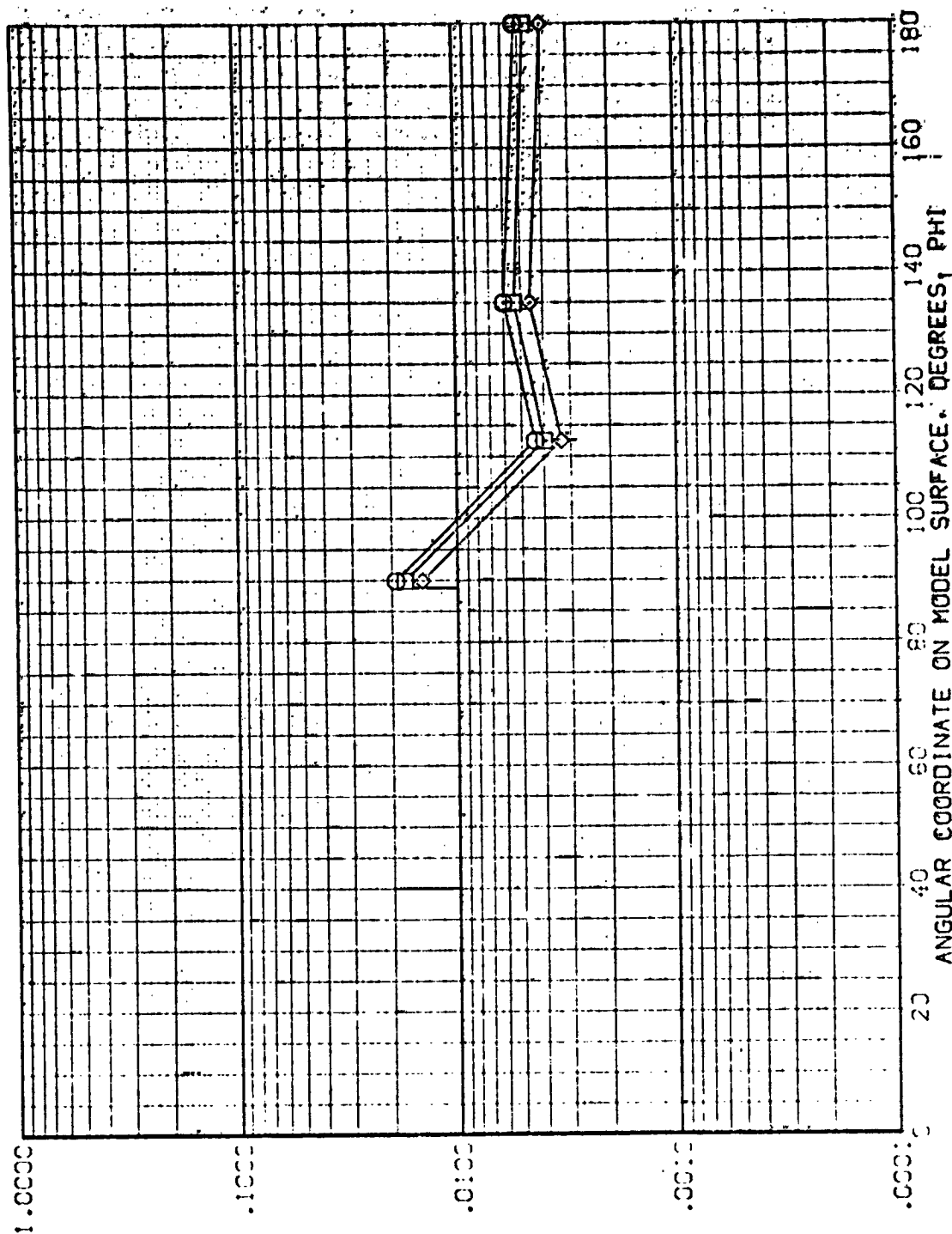


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV T03)

PARAMETRIC VALUES  
 GC.000 BETA .000  
 PN/L 1.000

SWRCH H<sub>2</sub>O/WT X/L VACH  
 .850 .400 5.220  
 .930  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

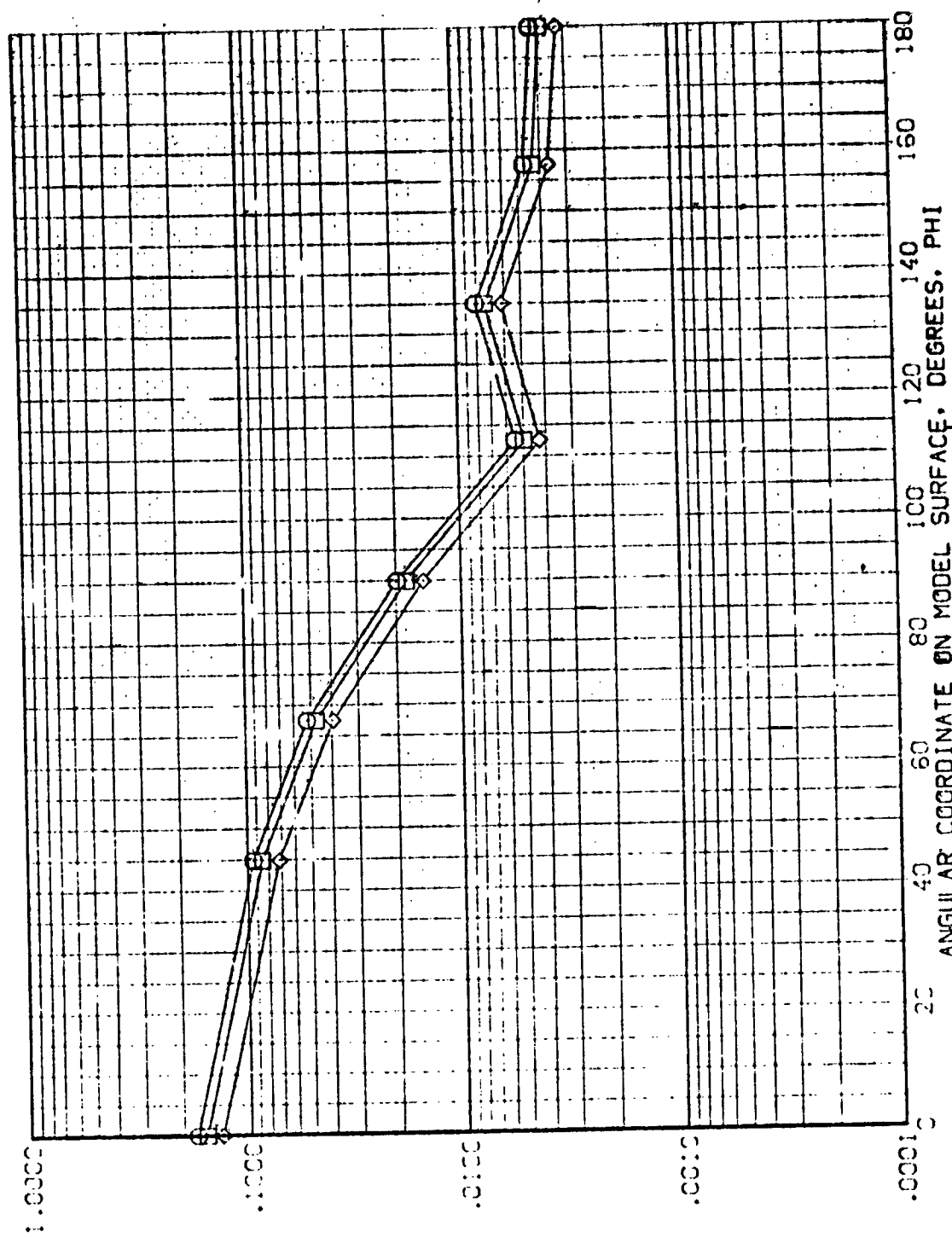


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AVES 3.5-195 1H28 01+T1 EXTERNAL TANK

(RENTOS)

SYMBOL

WAV/IN X/L WACH  
 .850 .500 5.220  
 .900  
 1.000

PARAMETER VALUES  
 ALPHA 60.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

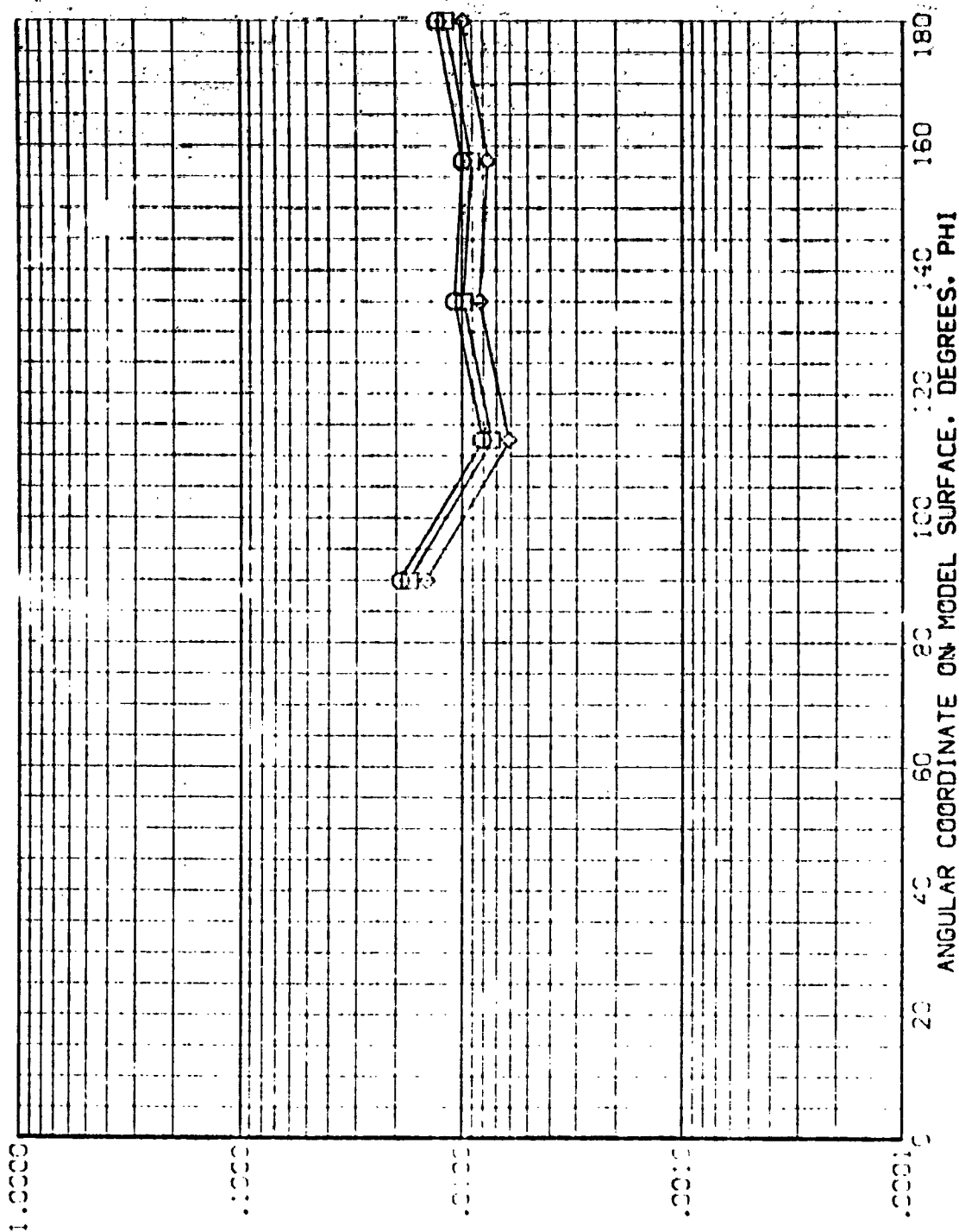


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REF ID: A66114  
 ORIGINAL PAGE IS  
 UNREPRODUCIBLE

AVES 3.5-195 1428 01+T1 EXTERNAL TANK

(REV T03)

SIZE: 11.0  
 DATE: 1955  
 K/L: .550  
 W/C: 5.000

PARAMETRIC VALUES  
 ALP-A: .000  
 R/L: 1.000  
 BETA: .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

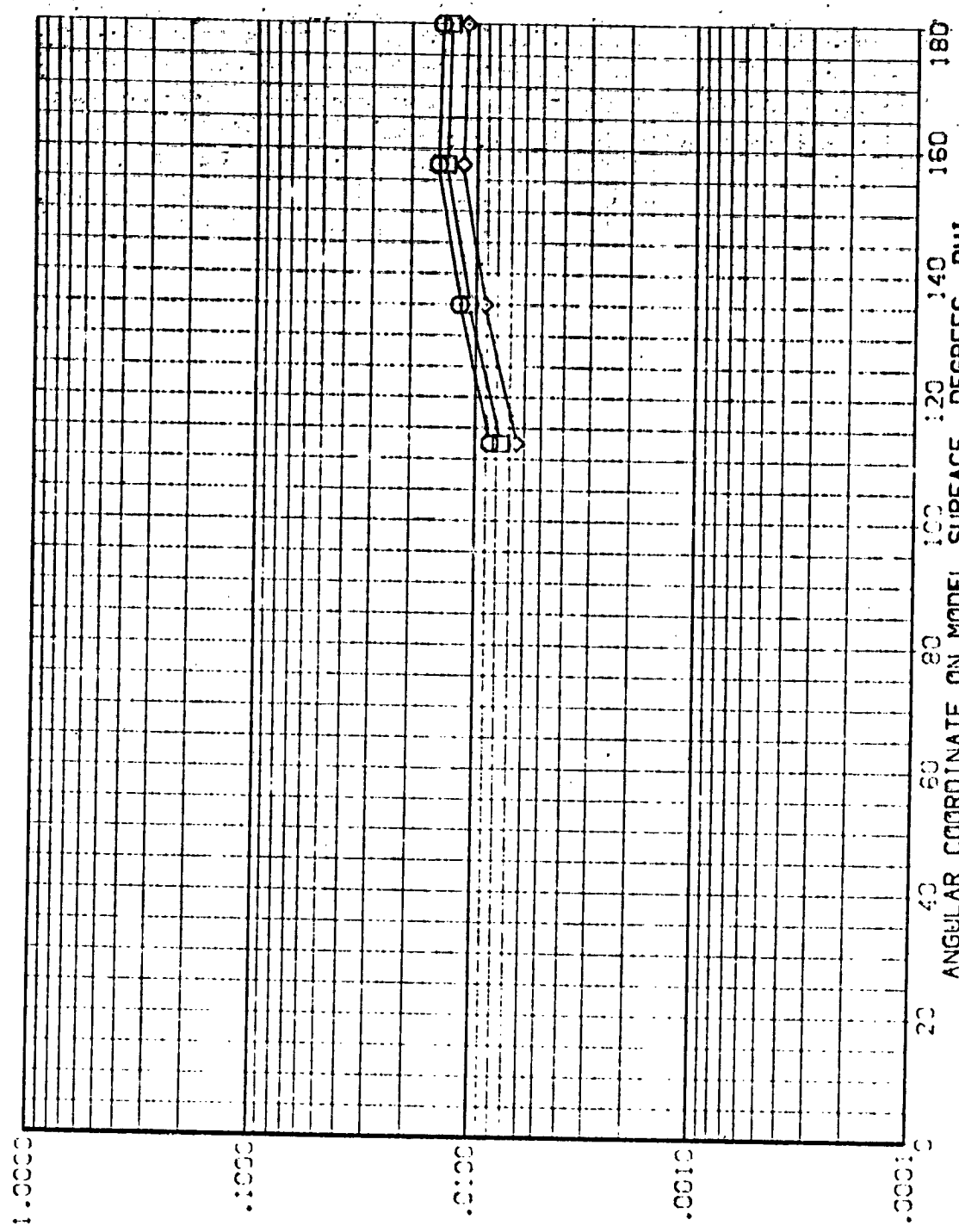


FIG. 5 TANK, IN THE PRESENCE OF ORBITER  
 ANGULAR COORDINATE ON MODEL SURFACE, DEGREES. PHI

AVES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REVTO3)

SVES-

WAVELENGTH X/L MACH  
 .250 .600 5.220  
 .900  
 1.000

PARAMETER VALUES  
 ALPHA 60.000  
 R/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

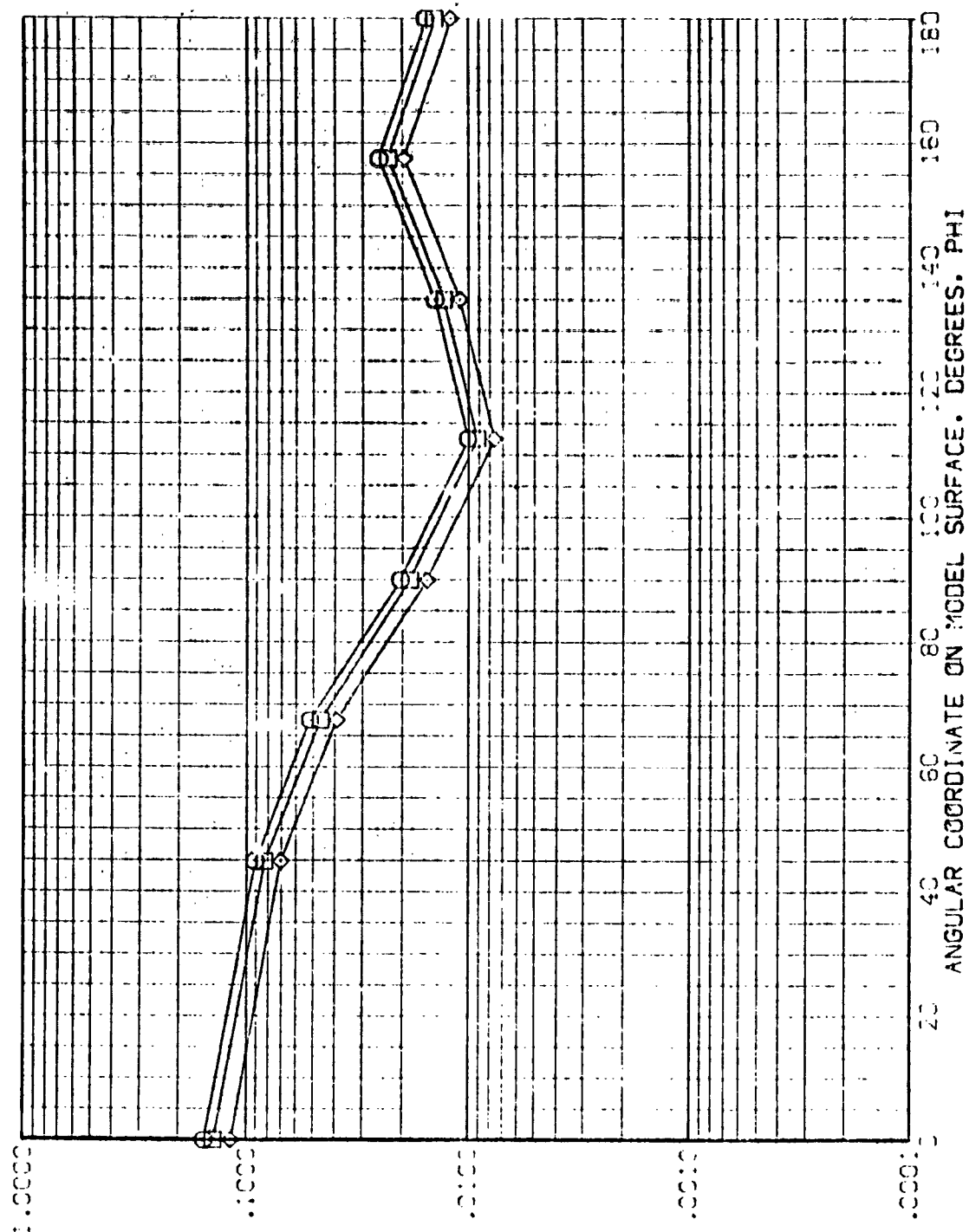


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 C1+T1 EXTERNAL TANK

(REV T03)

SYMBOL

HAIRY

1/2

VACH

5.220

.600

.300

1.000

PARAMETRIC VALUES

60.000

BETA

1.000

ALPHA

PI/L

1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

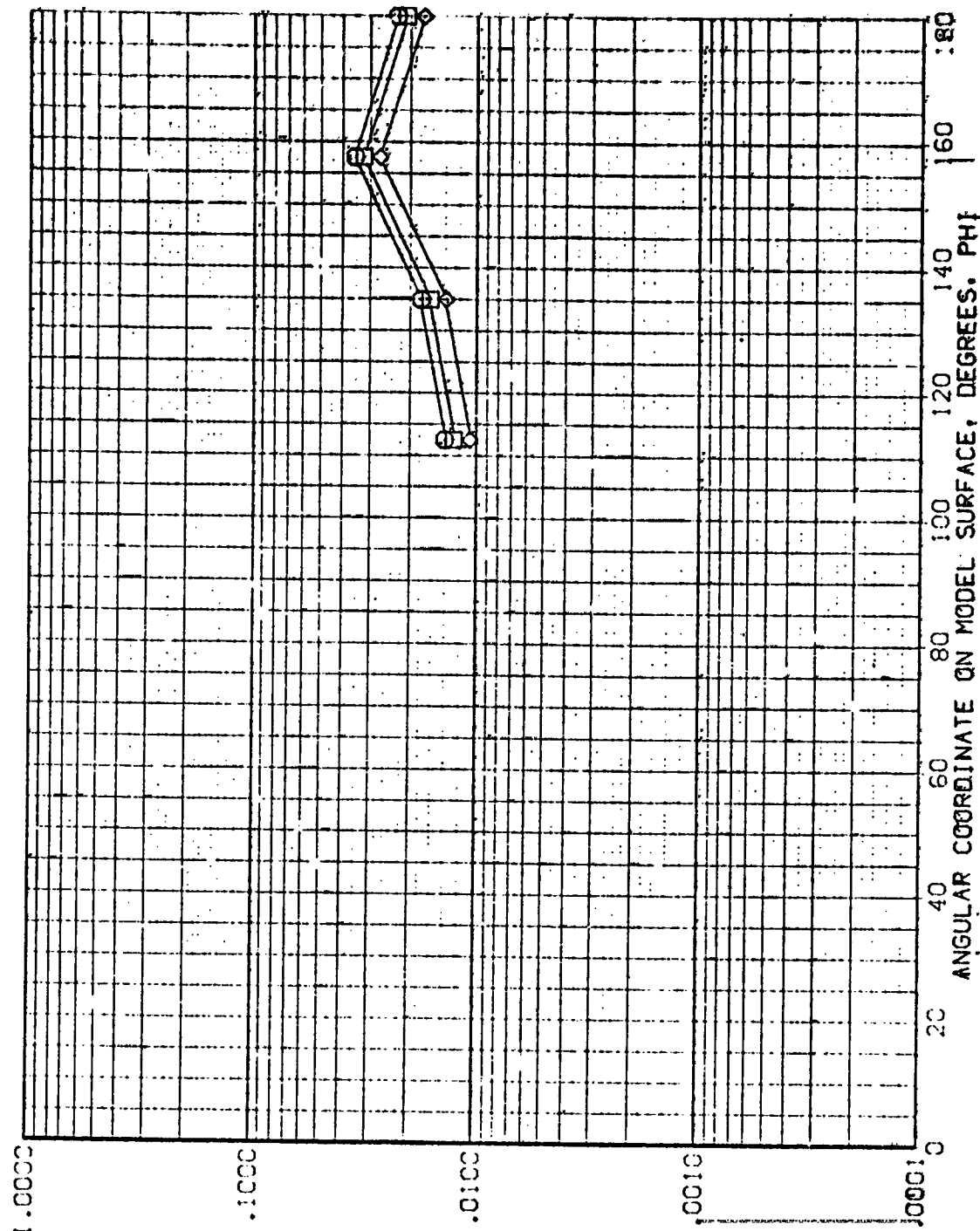


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



SYMBOL:  $\square$   $\diamond$

HA<sub>0</sub>/H<sub>T</sub>: .850 .900 1.000

X/L: .700

MACH: 5.220

PARAMETRIC VALUES

ALPHA: .0000

BETA: .000

PM/L: 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

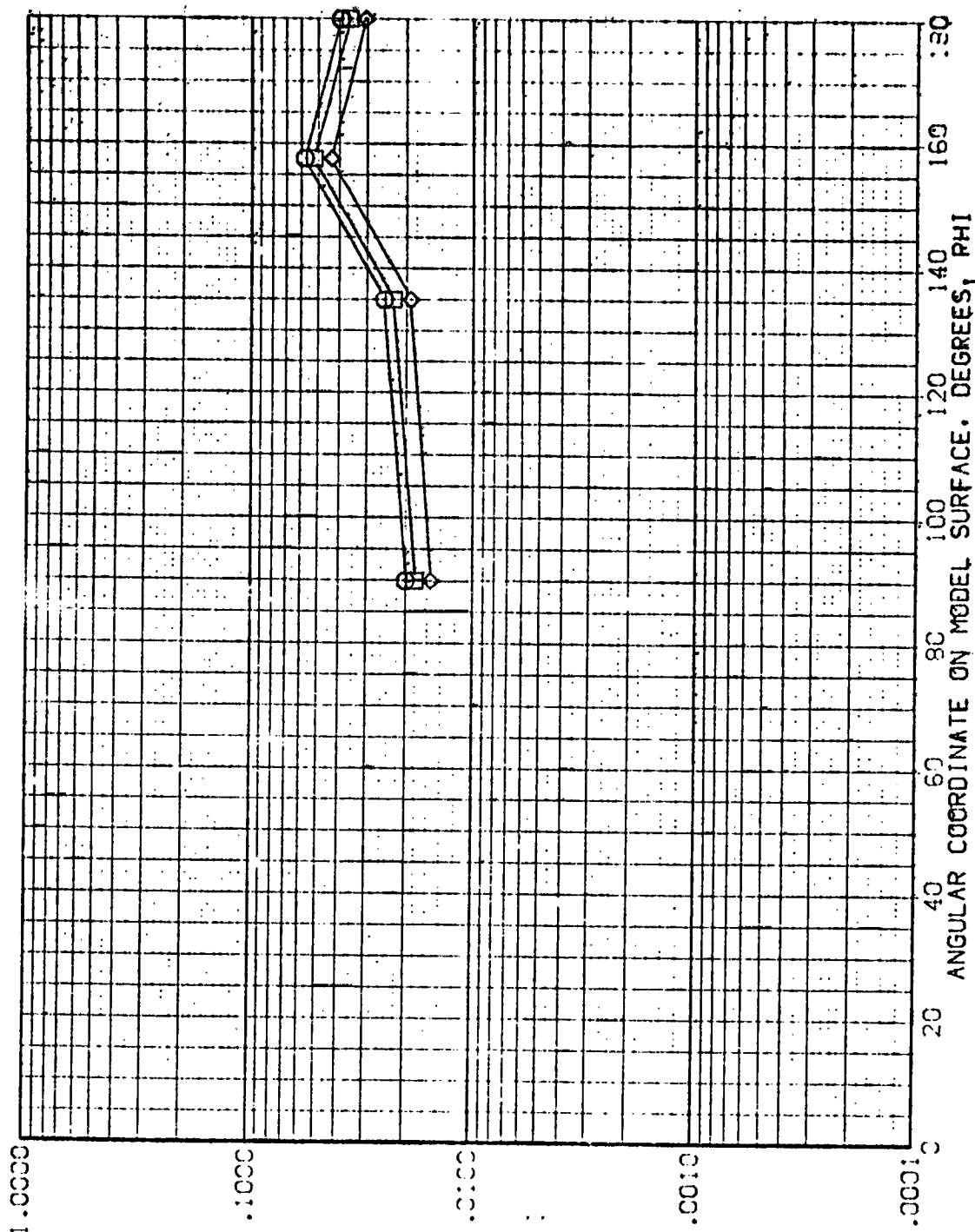


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01+11 EXTERNAL TANK

(REV103)

SYMBOL H/W/HI X/L MACH  
 .85C .750 5.220  
 .90C  
 1.000

PARAMETRIC VALUES  
 ALPHA  
 PV/L  
 50.000 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

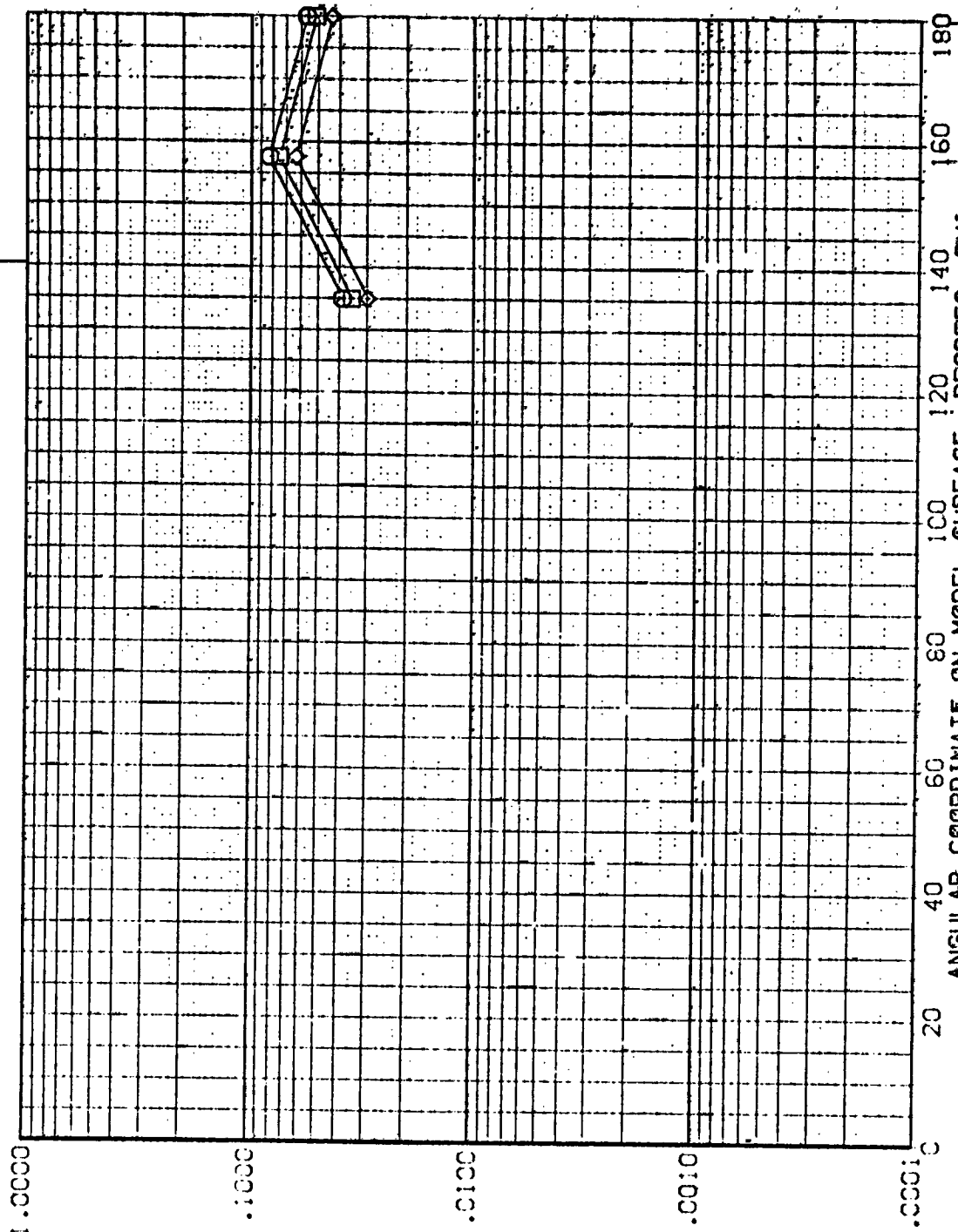


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV T03)

MAW/HT	X/L	MACH
.850	.800	5.220
.950		
1.000		

PARAMETRIC VALUES	
ALPHA	50.000
BETA	1.000
RM/L	.000

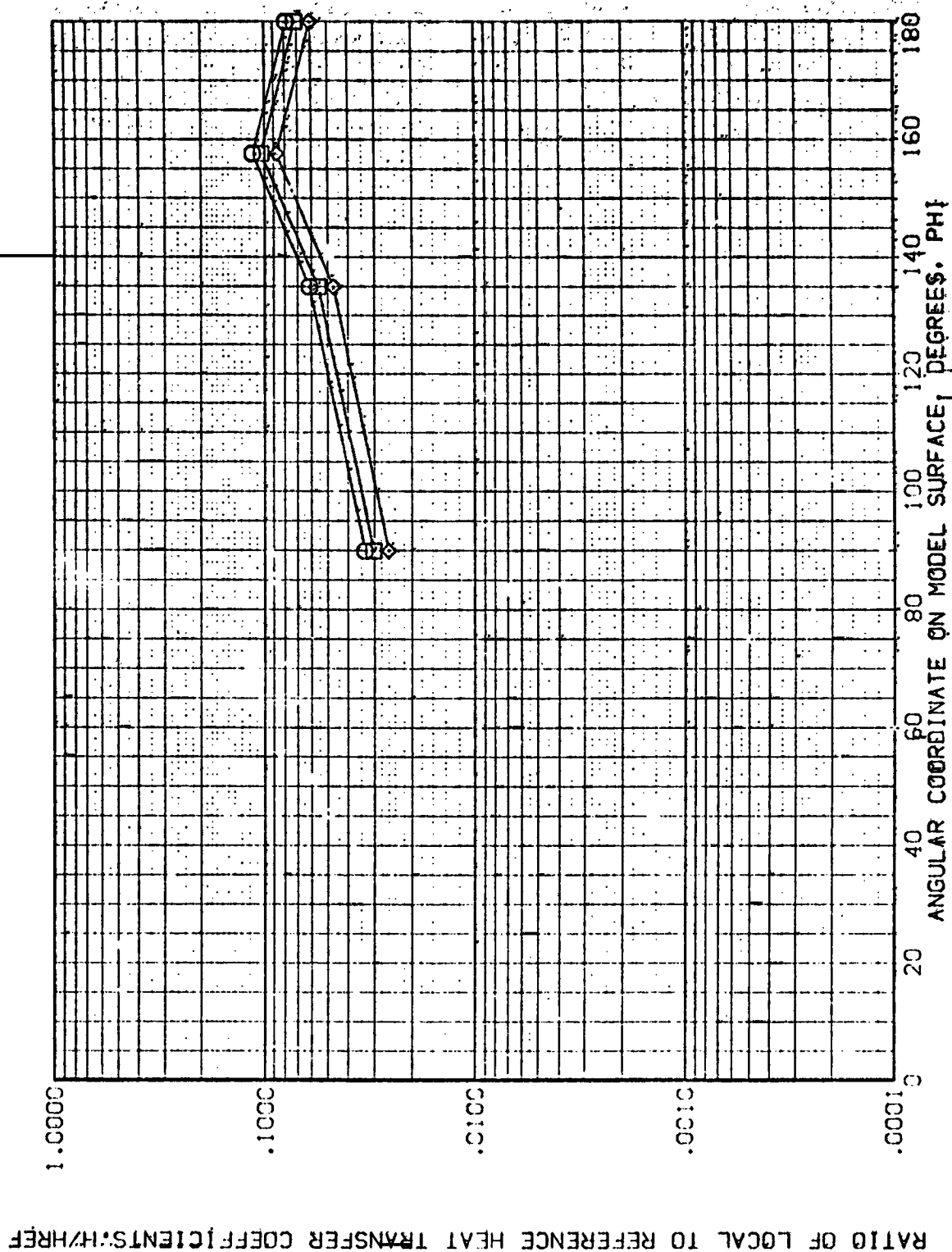


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

ANES 3.5-195 1428 01+T1 EXTERNAL TANK

(REV T03)

SYMBOL

WALL/IN

V/L

MACH

.850 .950 5.220

.950 1.000

ALPHA  
RN/L

PARAMETRIC VALUES  
60.000 BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

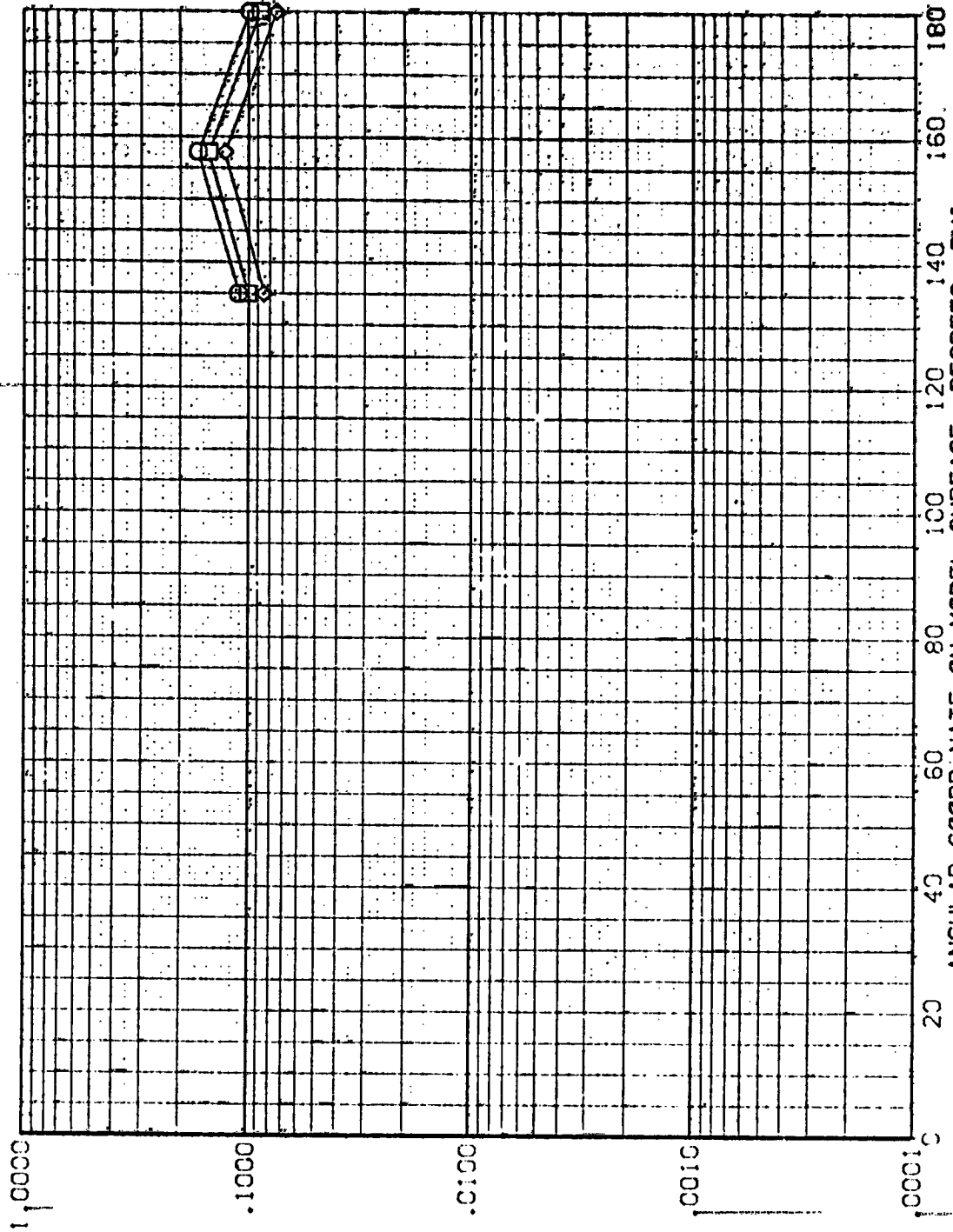


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL H/W/H/T X/L MACH  
 .850 .900 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA BETA  
 RM/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

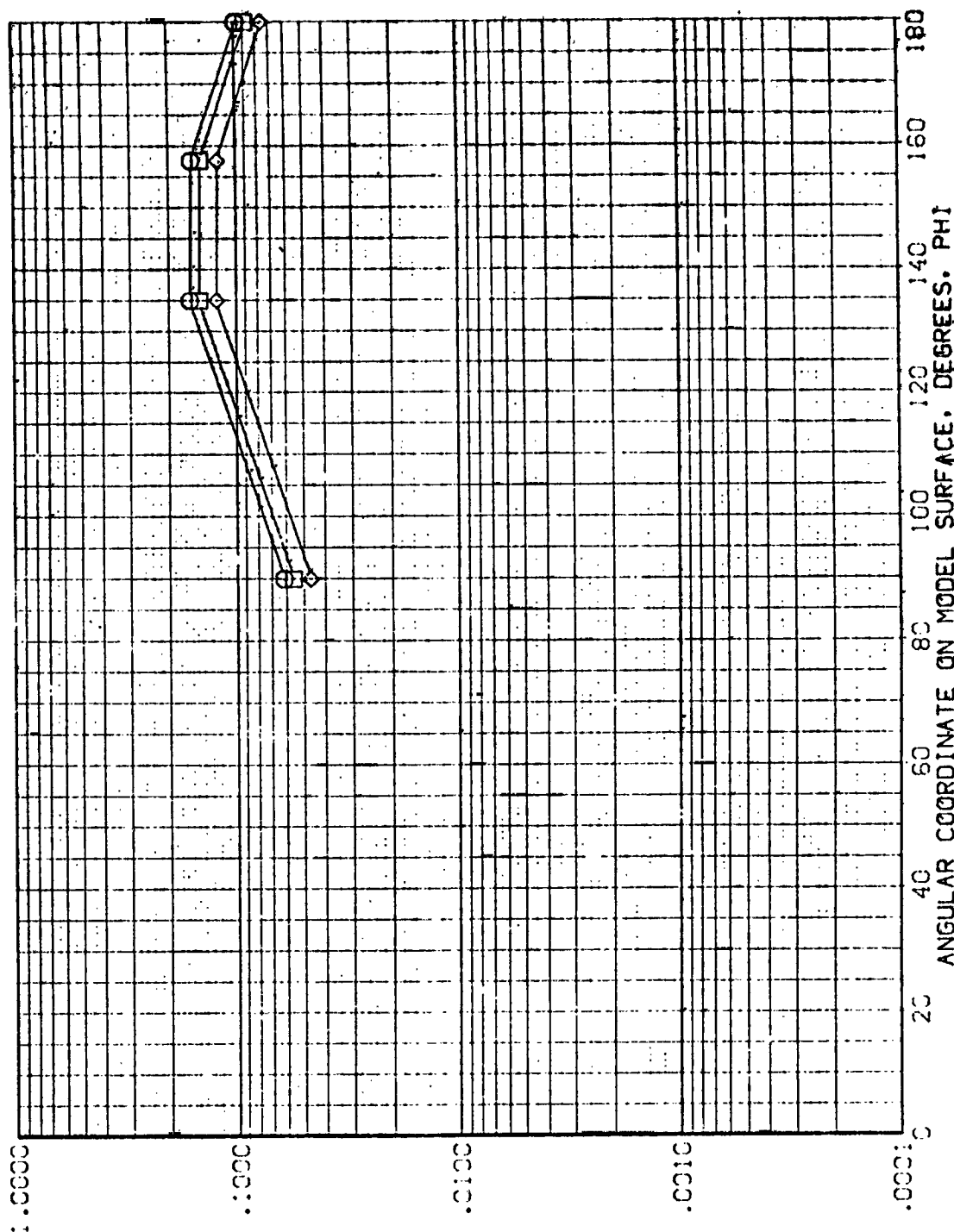


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 OI+T1 EXTERNAL TANK

(REV104)

SYMBOL  
 H<sub>2</sub>O<sub>2</sub> /  
 .850  
 .900  
 1.000

V/L  
 .350  
 WACH  
 5.221

PARAMETRIC VALUES  
 ALPHA  
 90.000  
 PVAL  
 1.000  
 BETA  
 .0000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

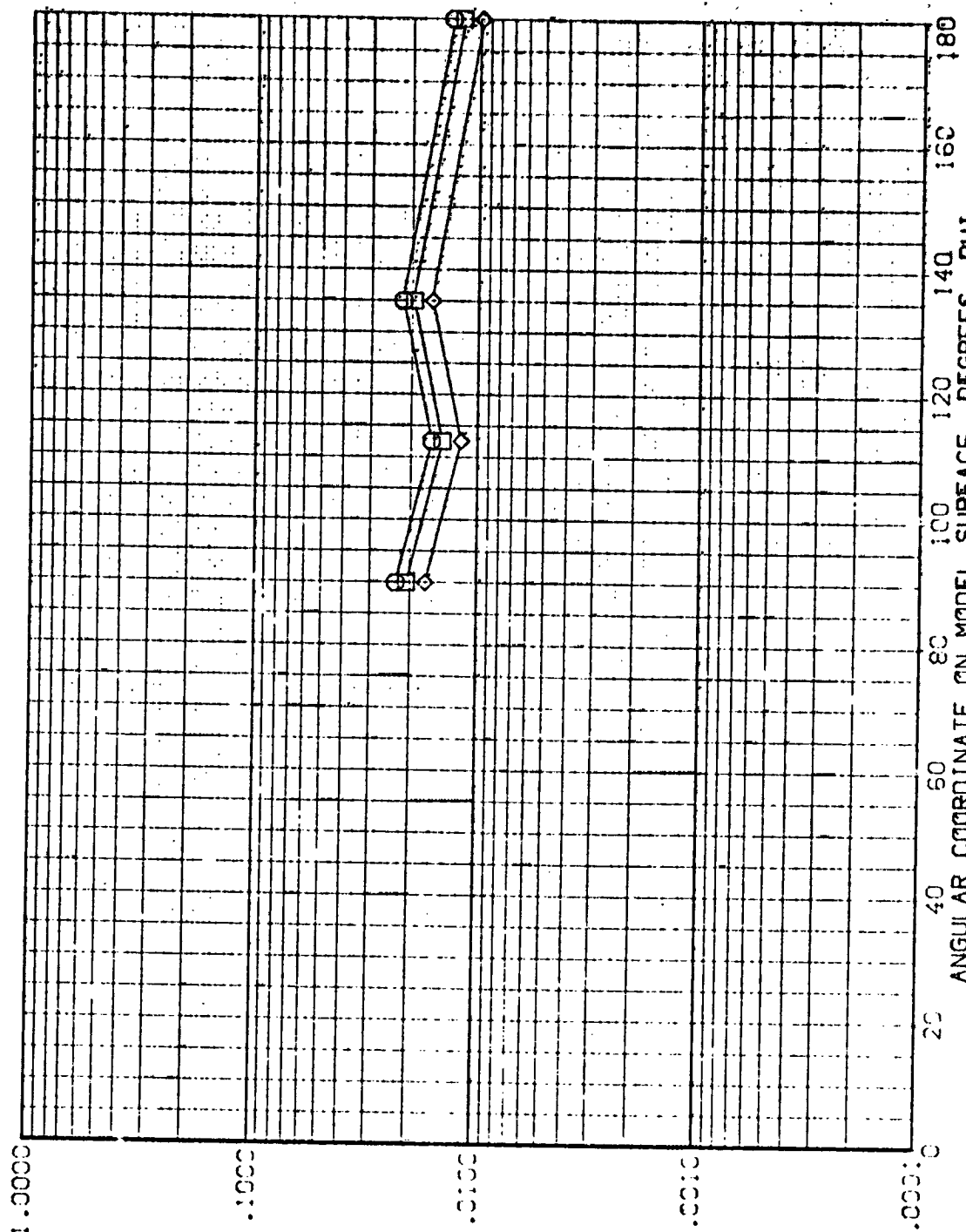


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01+T1 EXTERNAL TANK

(REV T04)

SYMBOL  
H/REF  
X/L  
MACH

.850  
.400  
5.221  
.900  
1.000

PARAMETRIC VALUES  
ALPHA  
90.000  
R/L

BETA  
1.000  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

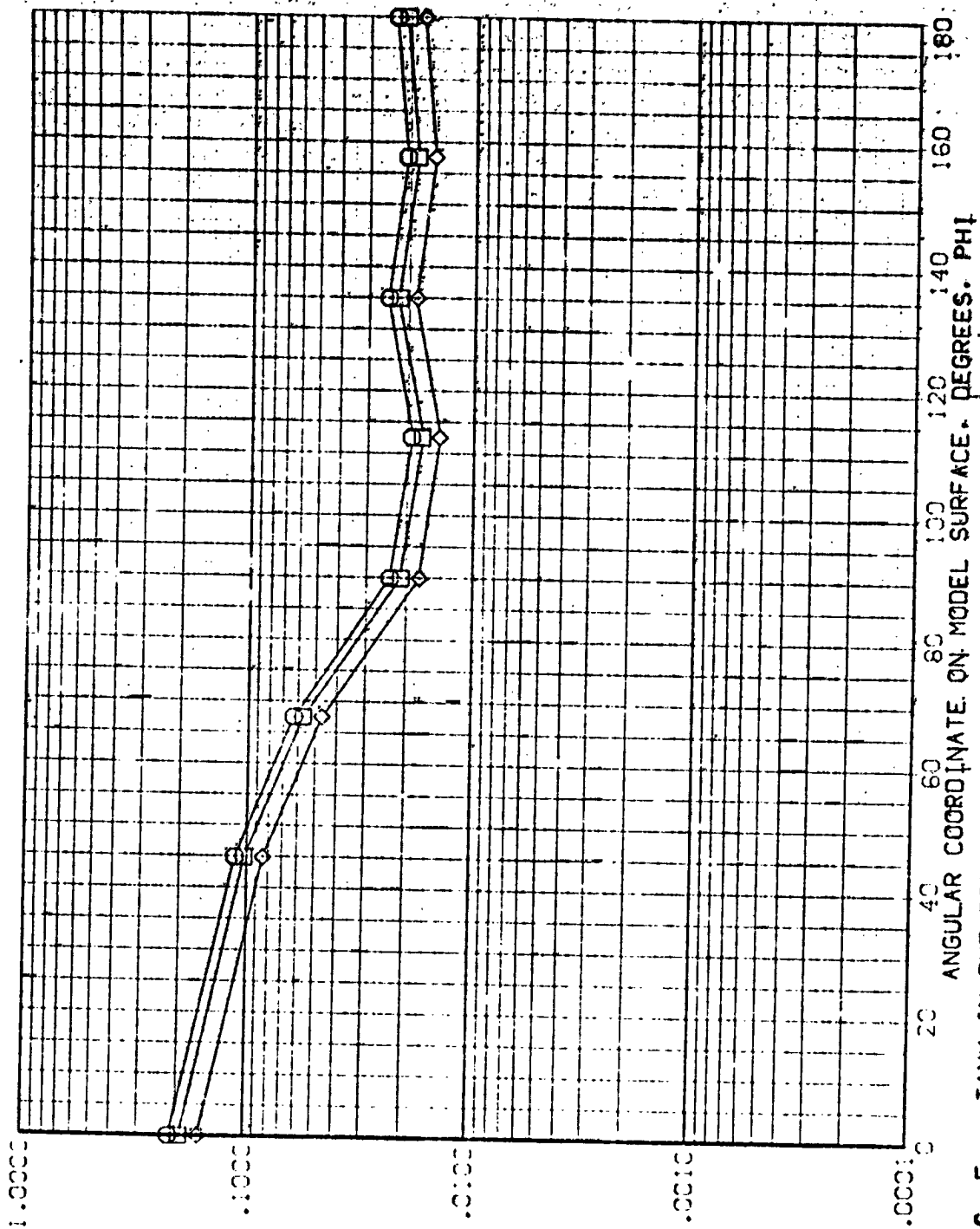


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1-28 01+11 EXTERNAL TANK

(REVTO4)

SYMBOL:  $\diamond$   $\square$   $\circ$   $\triangle$   
 WAVELENGTH: .850 .900 1.000  
 WAVELENGTH: .450 5.221  
 WAVELENGTH: .450 5.221

PARAMETRIC VALUES  
 ALPHA: 1.000  
 BETA: .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

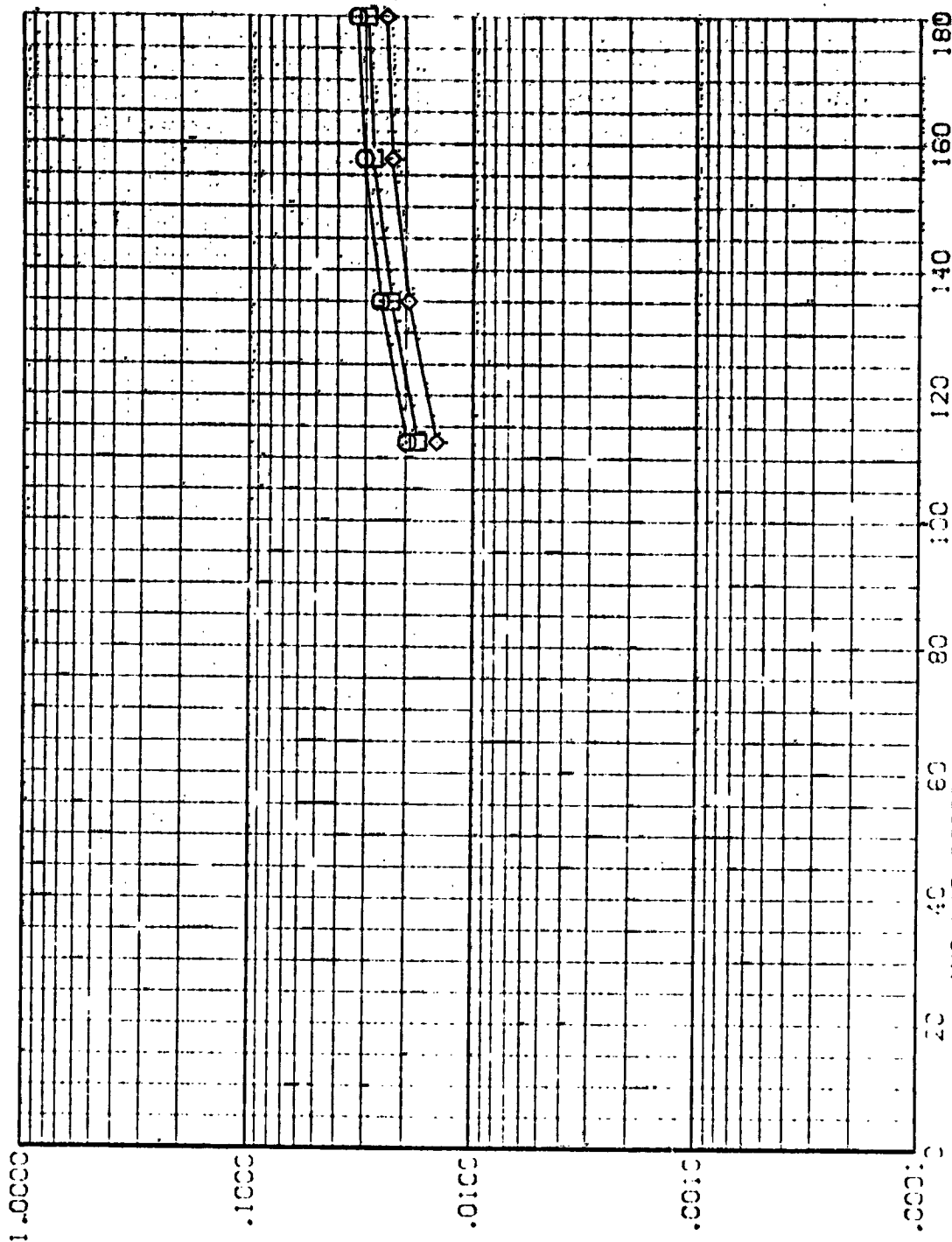


FIG. 5 TANK, IN THE PRESENCE OF ORBITER  
 ANGULAR COORDINATE ON MODEL SURFACE, DEGREES, PHI



AVES 3.5-195 1428 01-11 EXTERNAL TANK

(REV 104)

SVES-  
MACH  
0.85  
0.90  
1.00

WACH  
5.22

PARAMETRIC VALUES  
ALPHA  
RNL  
00.000  
1.000  
0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

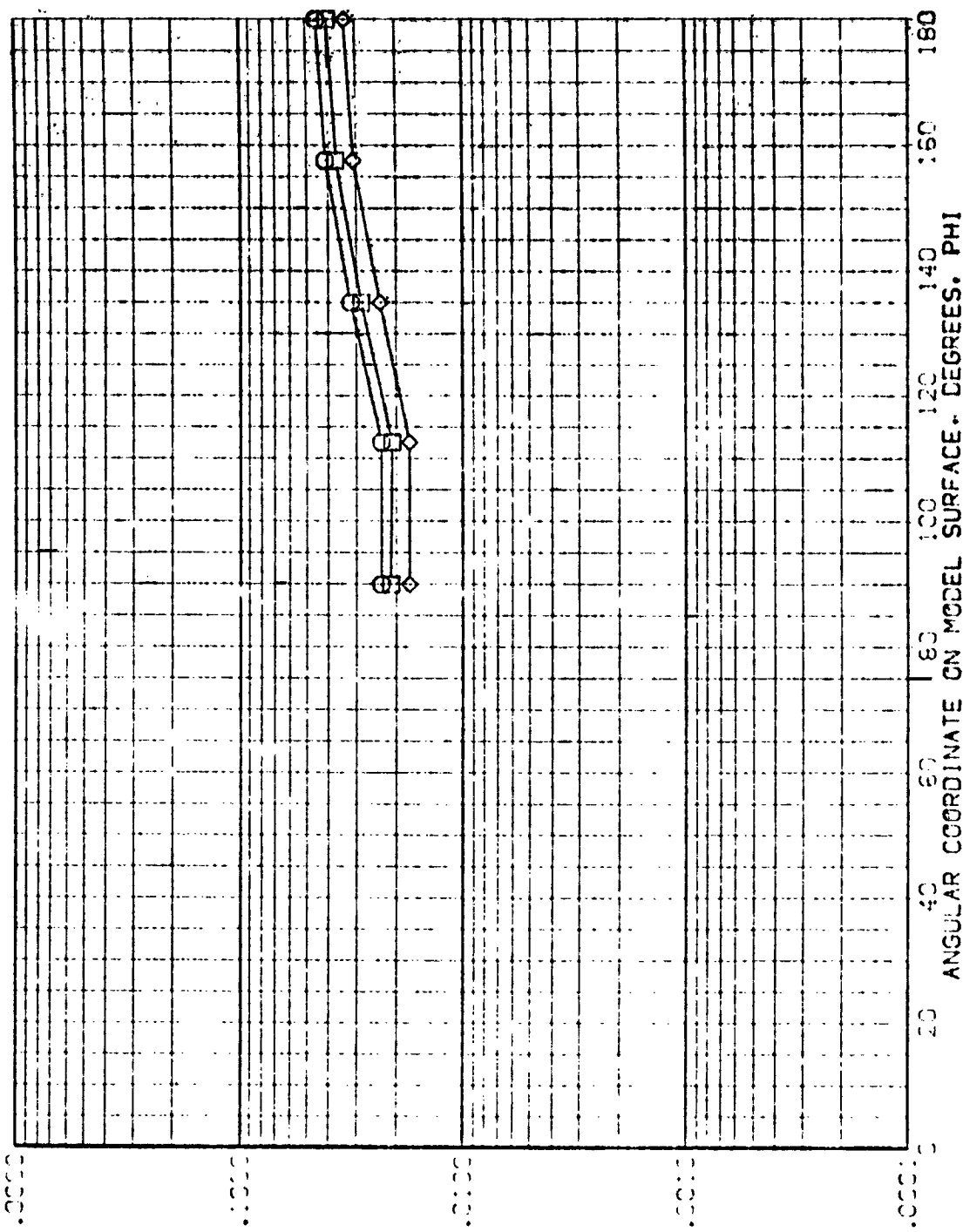


FIG. 5 TANK IN THE PRESENCE OF ORBITER

(REV. 04)

070303

11-11-61

ALPHA	BETA	PARAMETER VALUES
71/1	90.000	1.000

33.

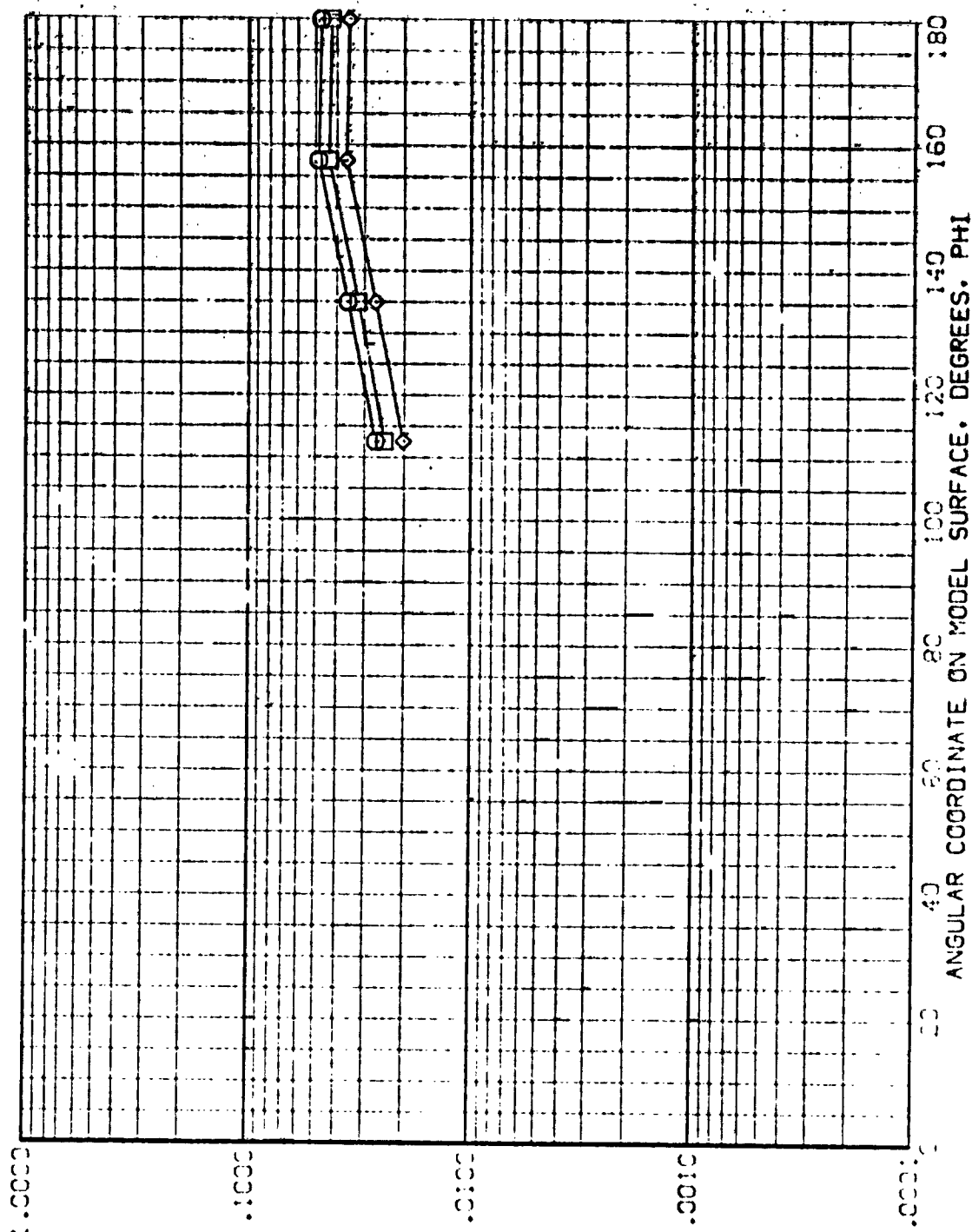
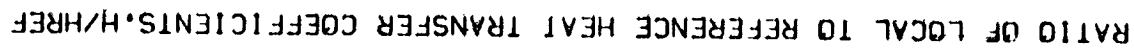


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01+T1 EXTERNAL TANK

(REVISED)

SYMBOL

WAVELENGTH  
1.950  
1.900  
1.850

WAVELENGTH  
1.950  
1.900  
1.850

PARAMETRIC VALUES  
ALPHA  
PM/L  
90.000  
1.000  
90.000  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

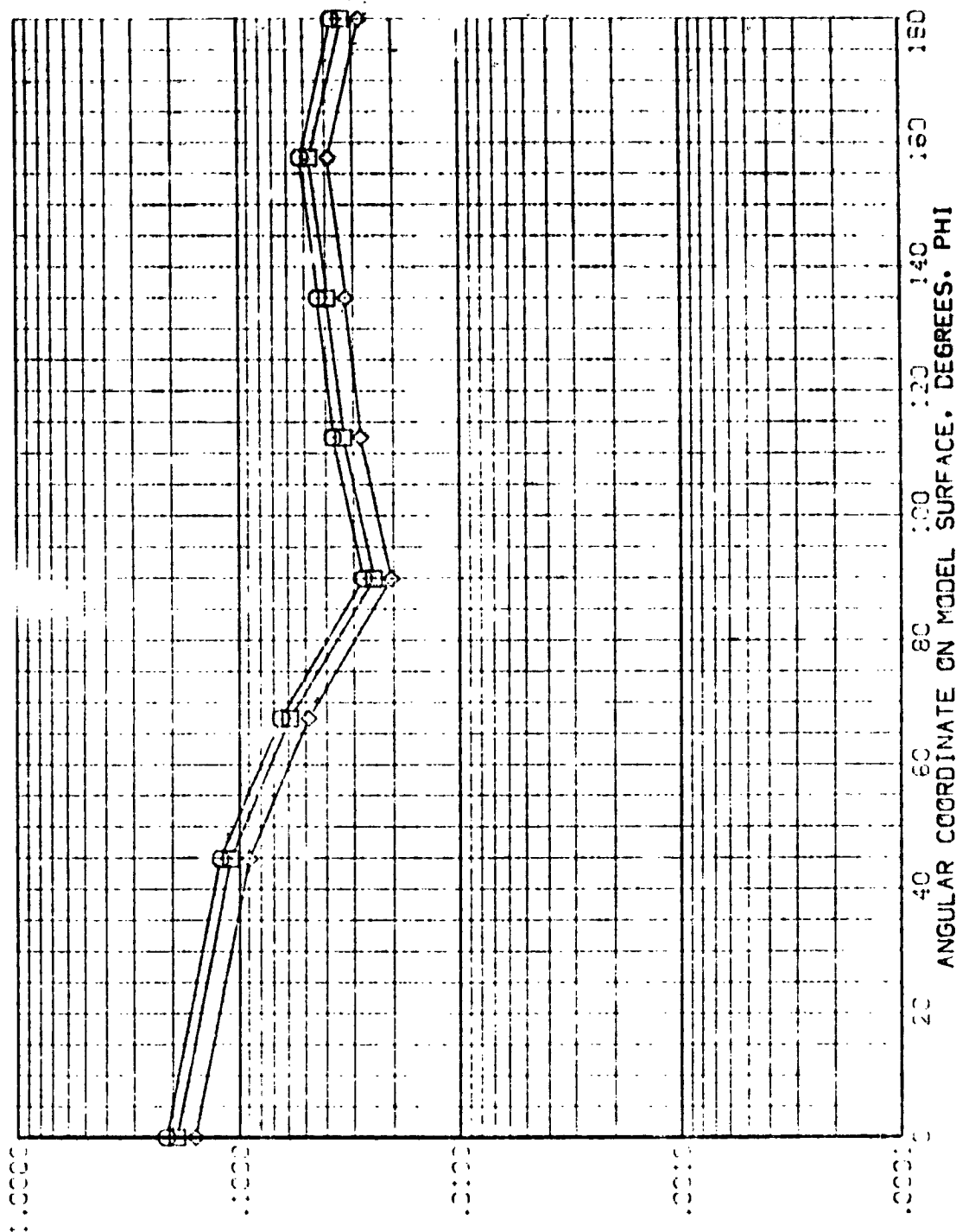


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REVISED)

[illegible]

1000  
1000

PARAMETRIC VALUES	
ALPHA	BETA
07.000	1.000
08.7	

**DOO.**

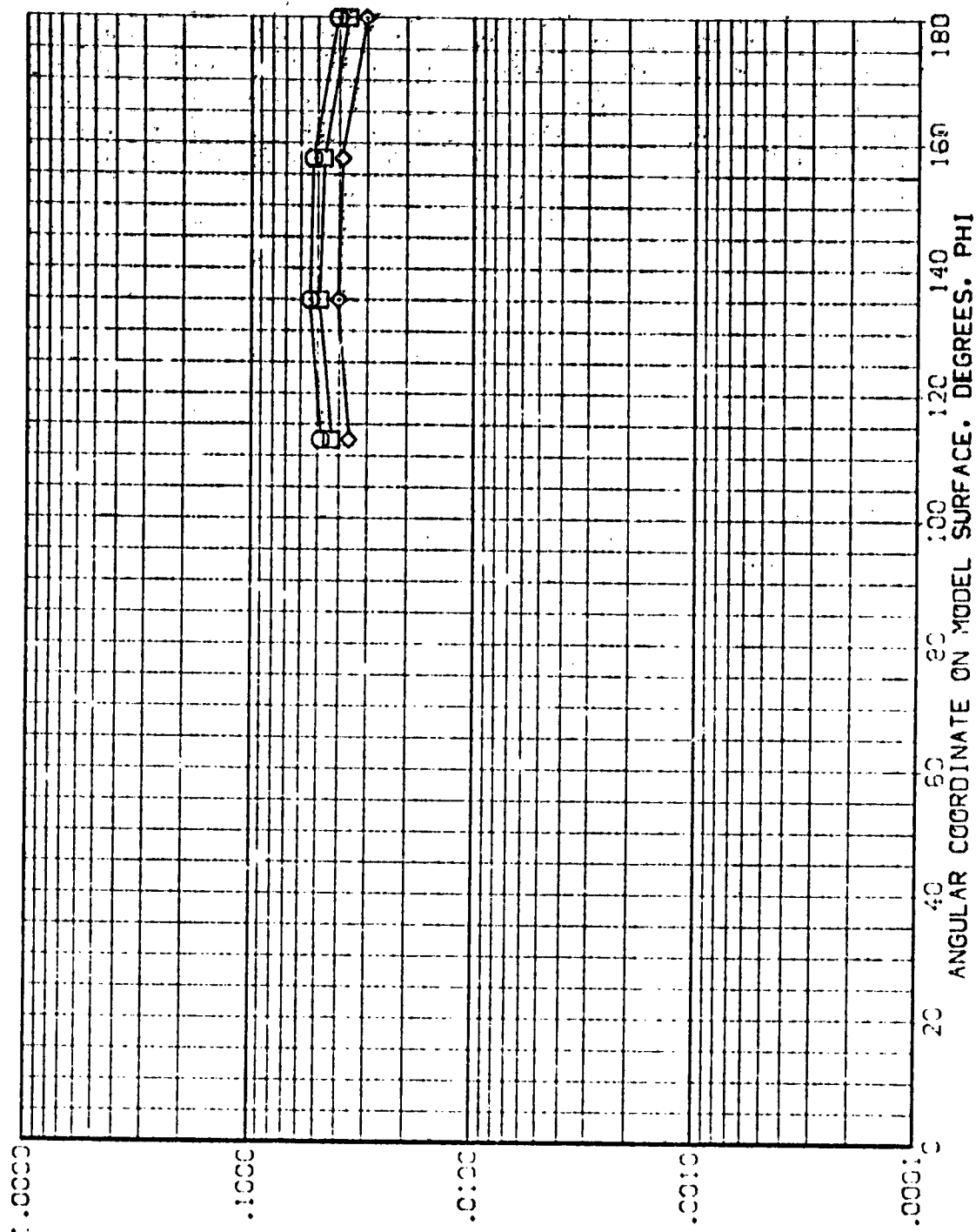
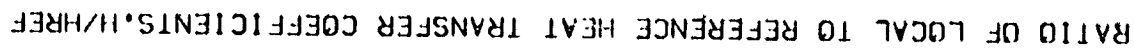


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01-T: EXTERNAL TANK

(REV) 041

SWEEP - 1/2 INCH  
 .850  
 .900  
 .950  
 1.000

MACH  
 5.221

BASIC GEOMETRIC VALUES  
 ALPHA 90.000  
 BETA 1.000  
 P/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

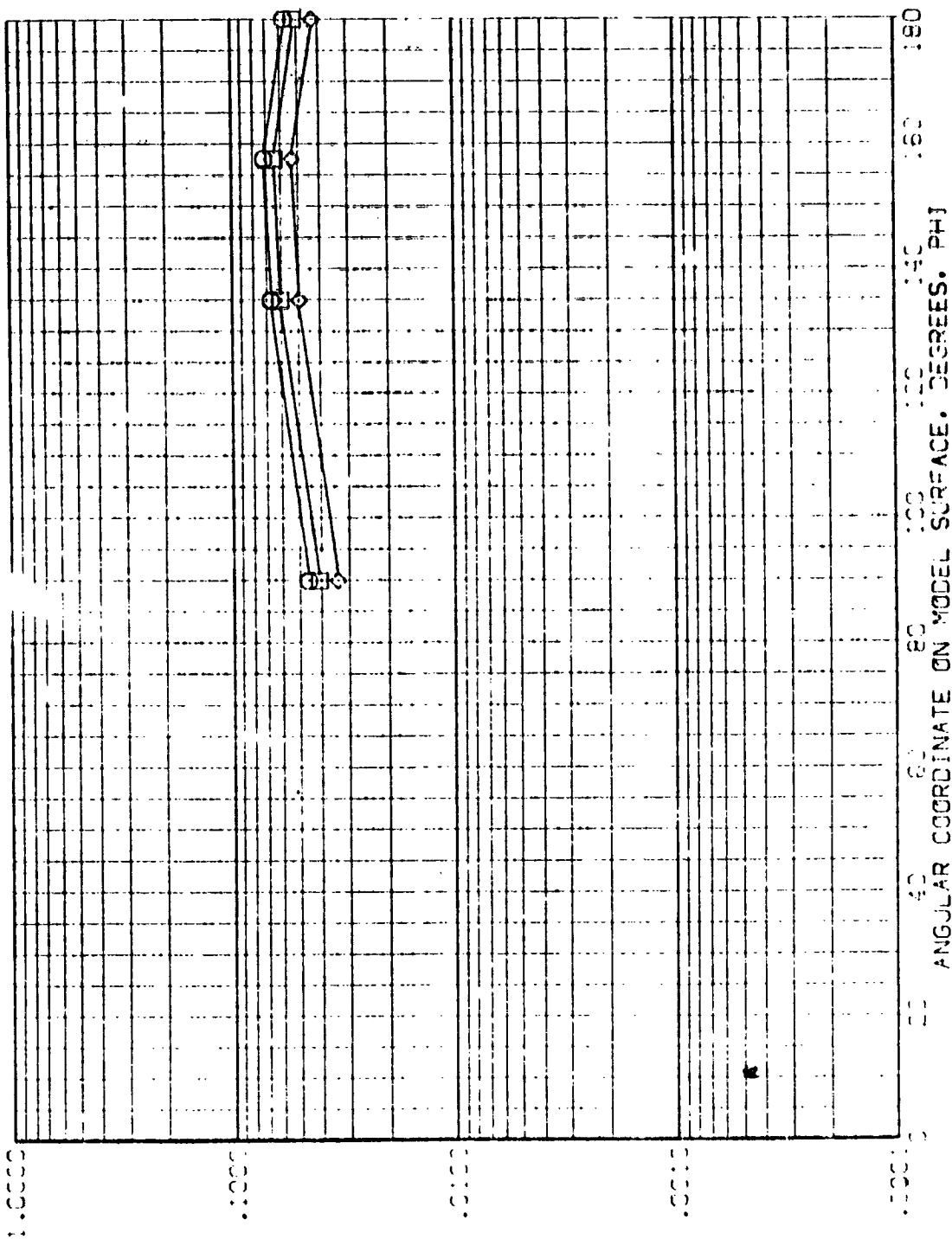


FIG. 5 TANK IN THE PRESENCE OF ORBITER

# AYES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV104)

SYMBOL  
 1.000  
 .500  
 .250  
 X/L  
 .750  
 MACH  
 5.221

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 .000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

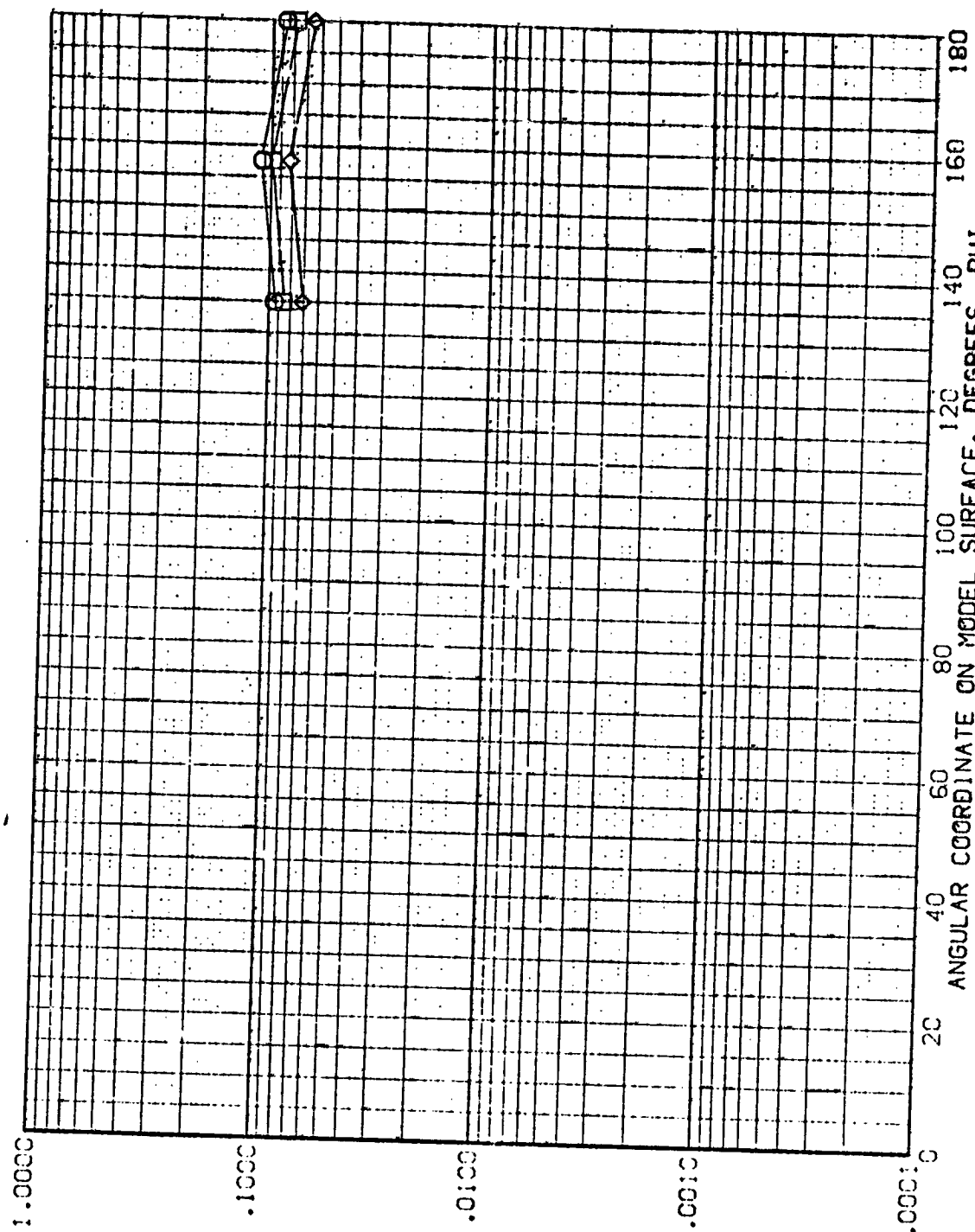


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-:95 IH28 01+T1 EXTERNAL TANK

(REVISED)

5010

1	( )	( )	( )
2	( )	( )	( )
3	( )	( )	( )
4	.	.	.
5			.

8.  
7/8

ACH  
5.221

PARAMETRIC VALUES	
ALPHA	BETA
R <sup>2</sup> /L	1.000
95.000	95.000

9.

VI 36  
VAL 1

0000  
0000  
0000

24 00 11

PH-1  
/L

• **Q:** How can I tell if my child has a learning disability?

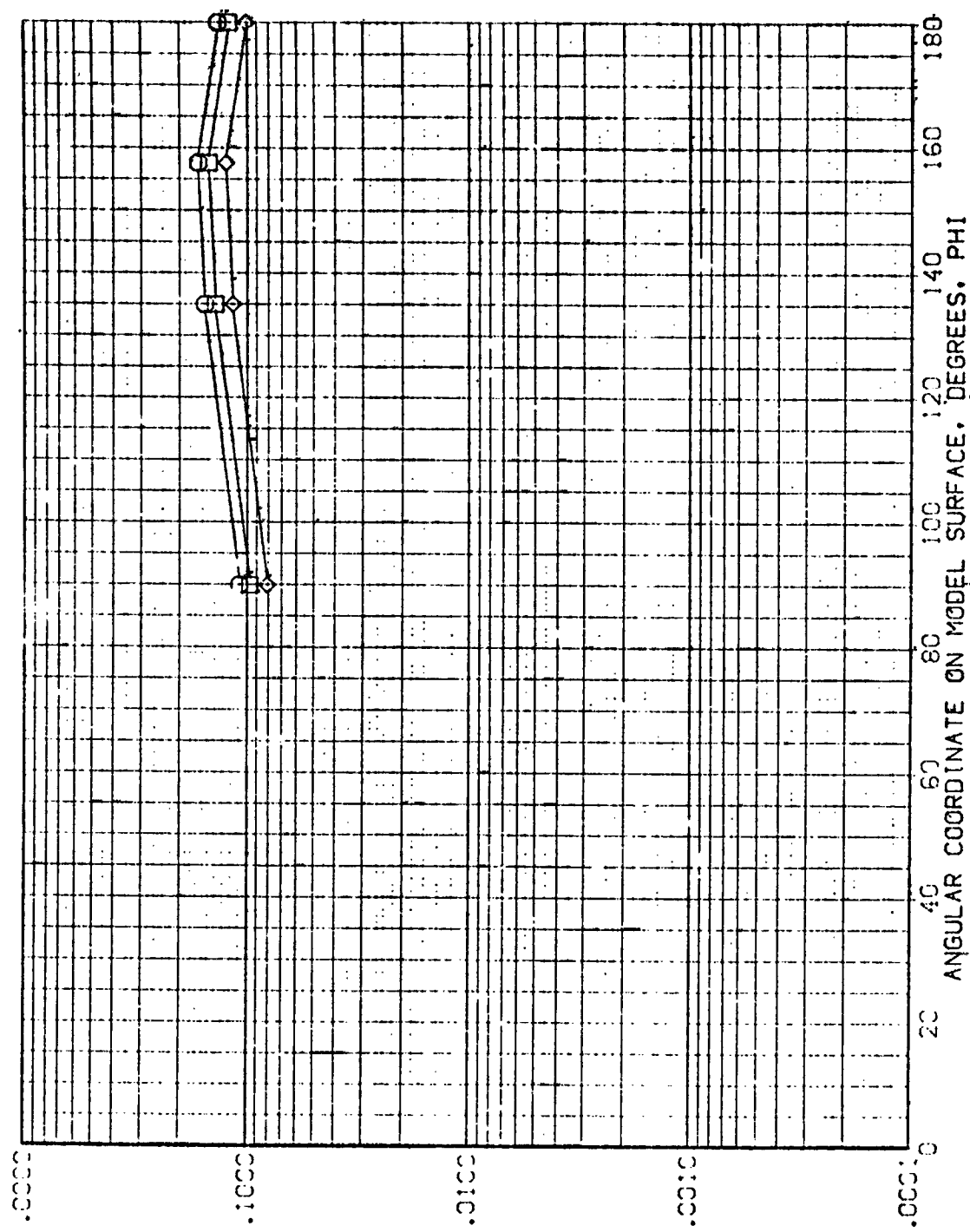
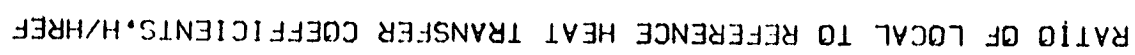


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 C1+T1 EXTERNAL TANK

(REV T04)

SYMBOL HAW/HT X/L MACH  
 □ .850  
 ○ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA 90.000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

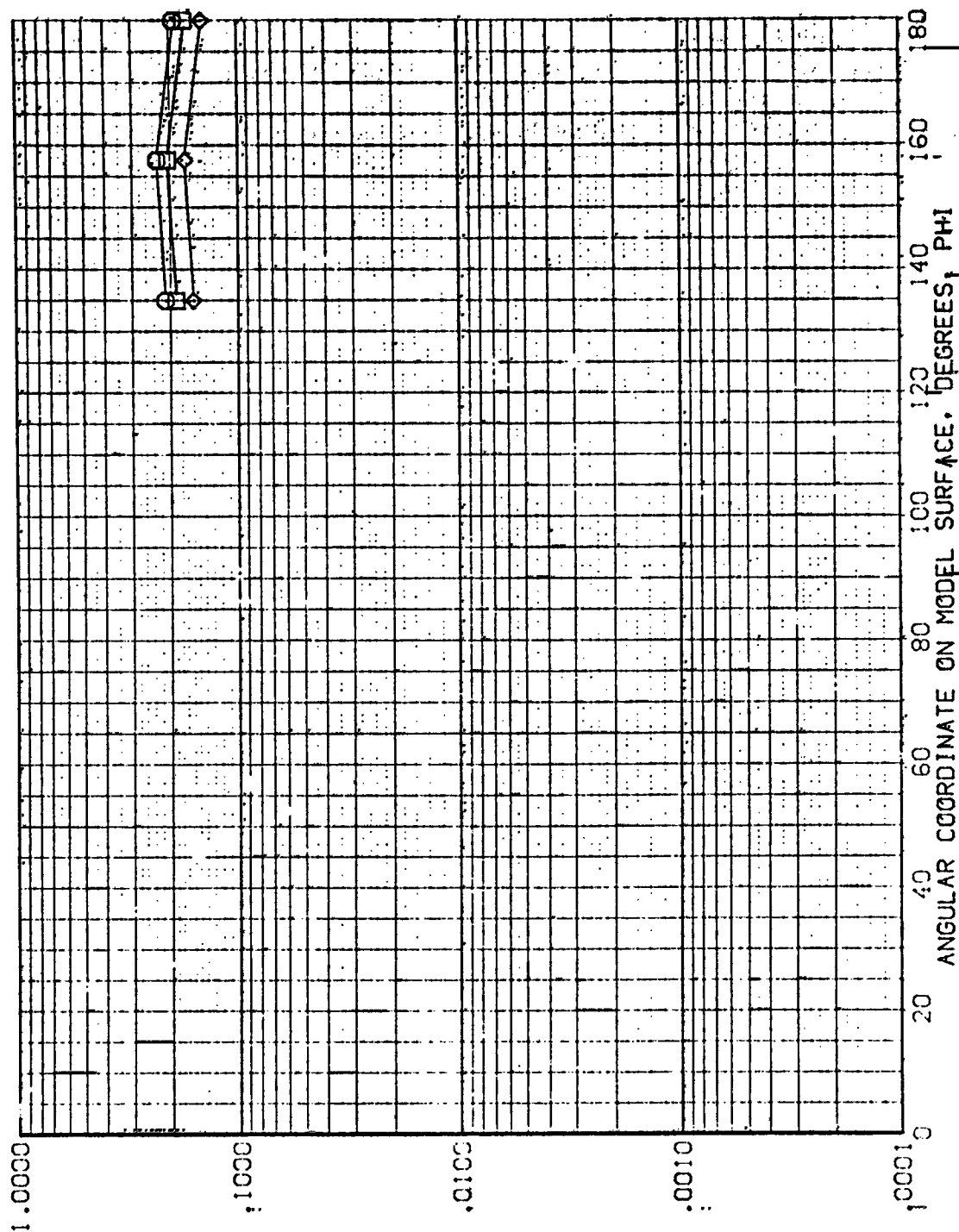


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AXES 3.5-195 1H28 01-71 EXTERNAL TANK

(REV104)

SYMBOL  
 $\diamond$  TO  
 .850  
 .900  
 1.000

WAVELENGTH  
 .300  
 MACH  
 5.221

PARAMETRIC VALUES  
 ALPHA  
 PH/L  
 90.000  
 .000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

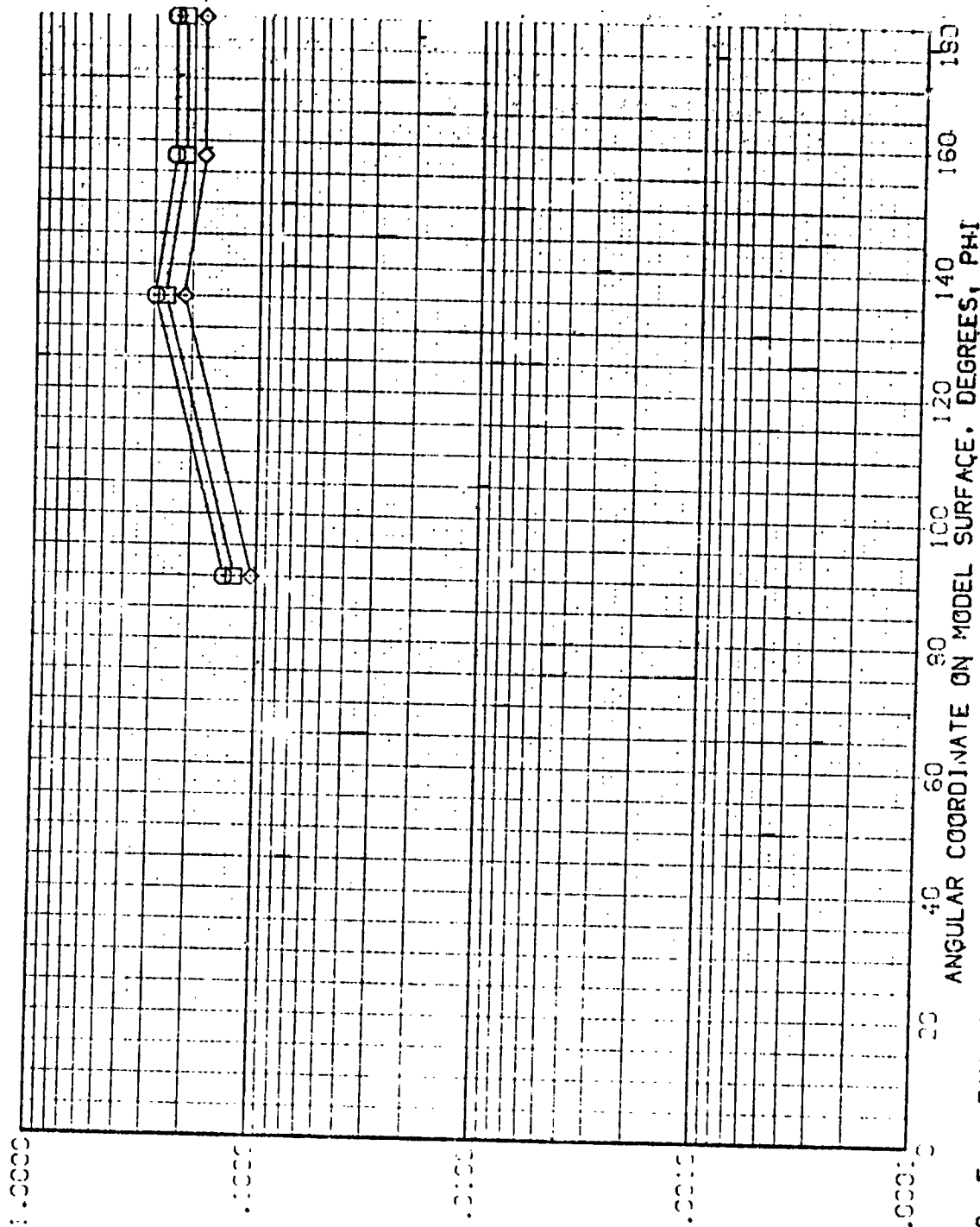


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 1H28 01-T1 EXTERNAL TANK

(REV T05)

SYMBOL

MAX/WT  
.850  
.900  
1.000

X/L  
.300

MACH  
5.221

PARAMETRIC VALUES

ALPHA  
RN/L

120.000  
1.000

BETA

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

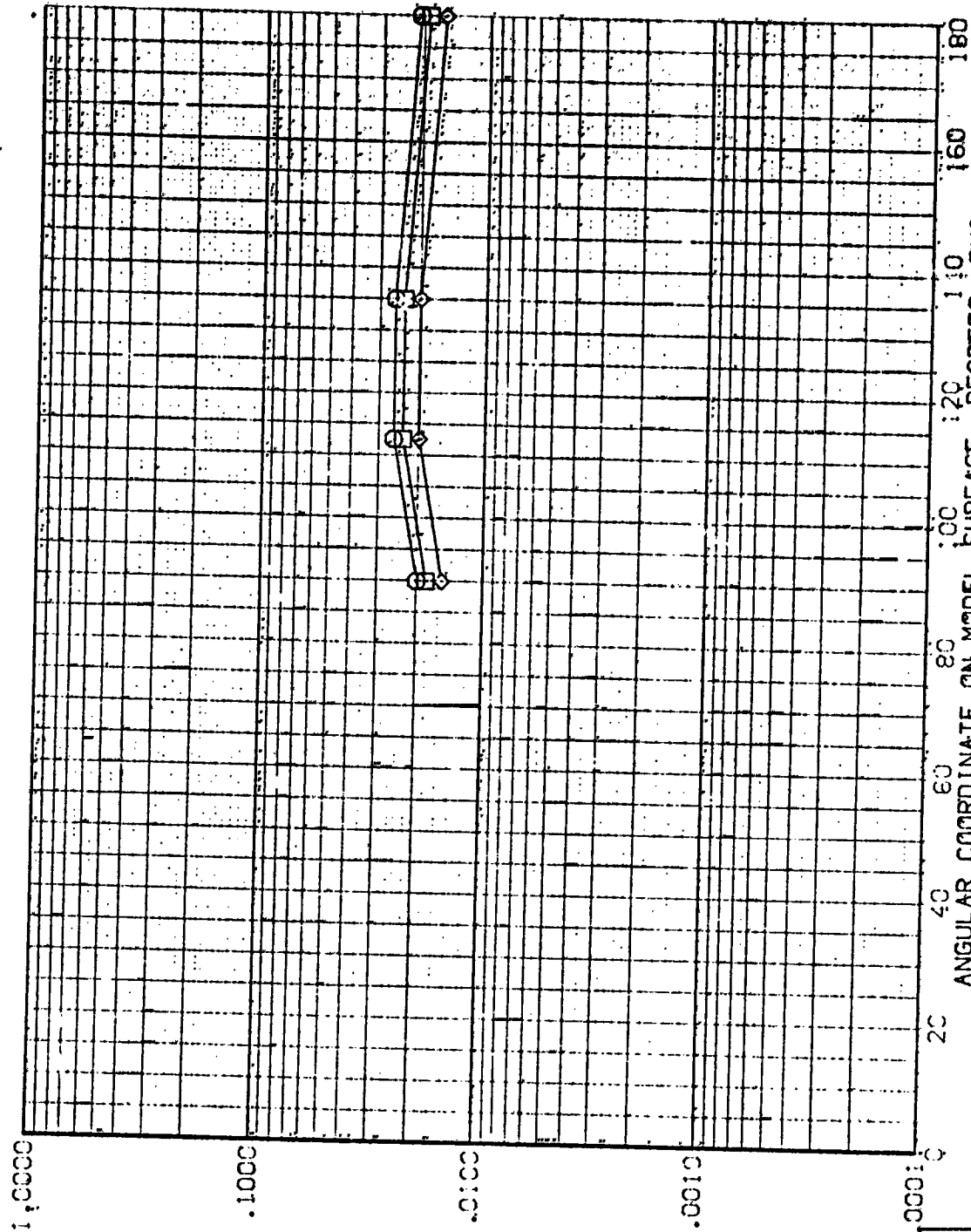


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T05)

SYMBOL HAY/HT X/L MACH  
 □ .850 .400 5.221  
 ◇ .900 .300 1.000

PARAMETRIC VALUES  
 ALPHA 125.000  
 RY/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

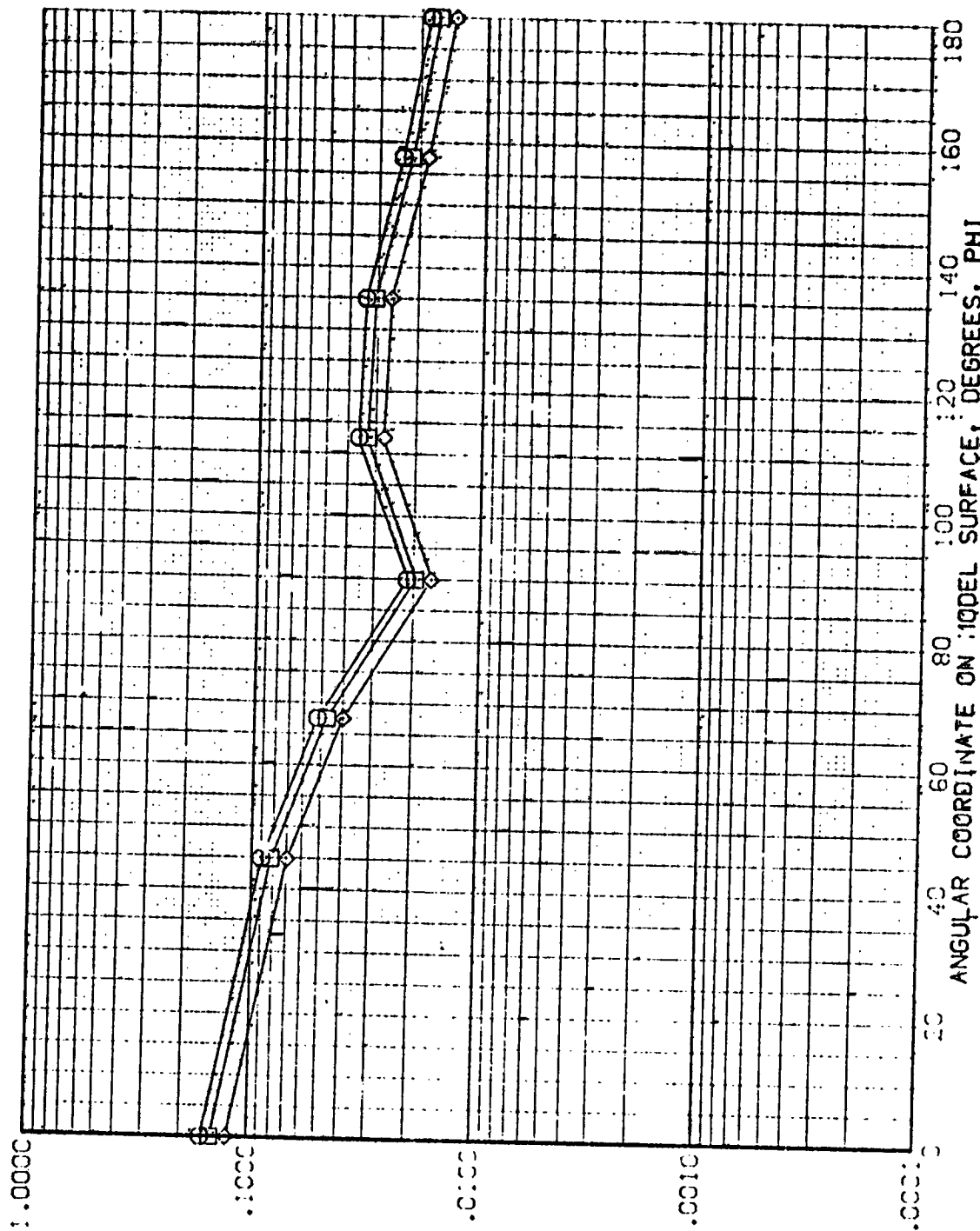


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AVES 3.5-.95 IH28 01+T1 EXTERNAL TANK

(REV T05)

SYMBOL: 4444-47  
 .850  
 .900  
 1.000

K/L .450  
 MACH 5.22

PARAMETRIC VALUES  
 ALPHA 120.000  
 BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

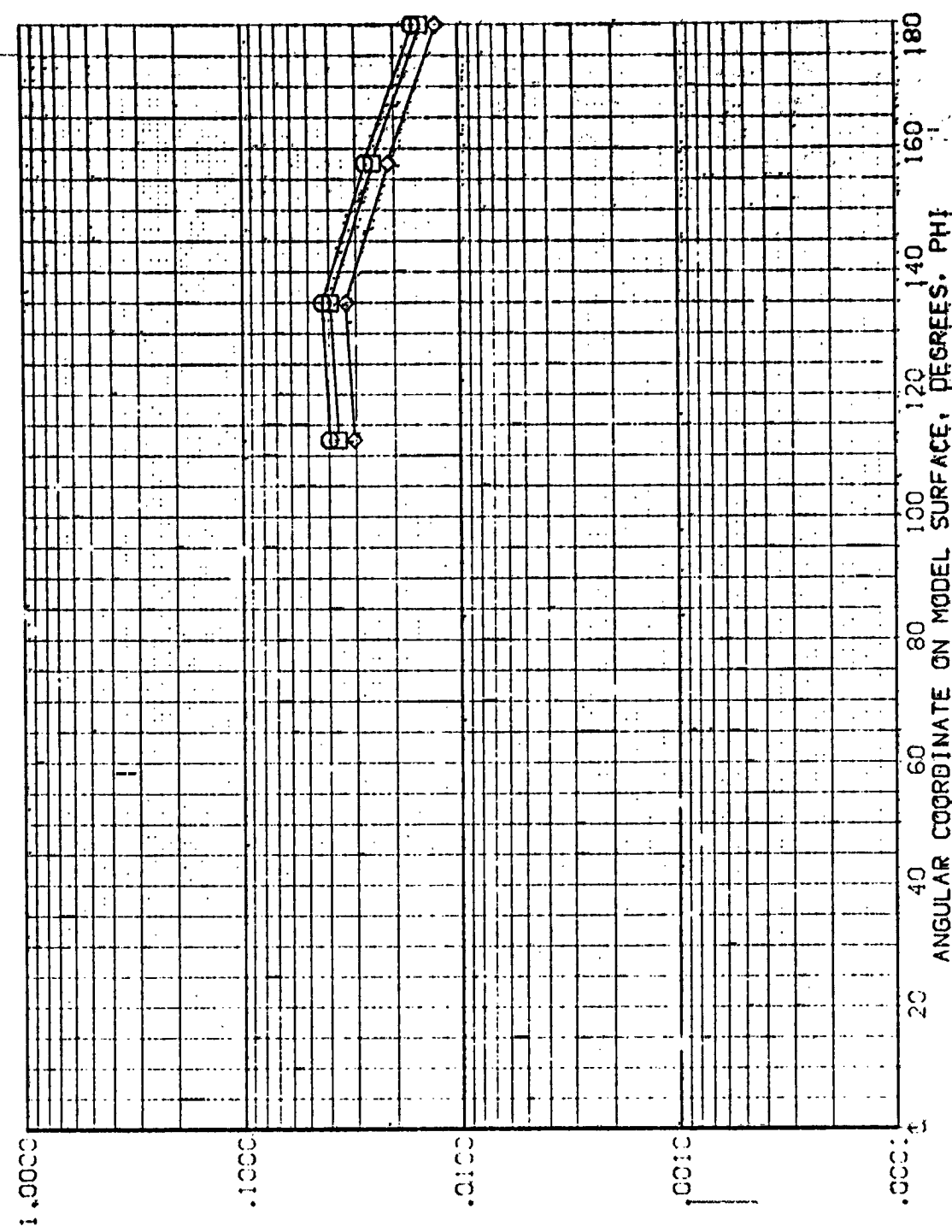


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3,5-195 1H28 01+T1 EXTERNAL TANK

(REV705)

SYMBOL  
H/W/T  
1850  
1900  
1.000

X/L  
.500  
MACH  
5.221

PARAMETRIC VALUES:  
ALPHA  
RNL  
179.060  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

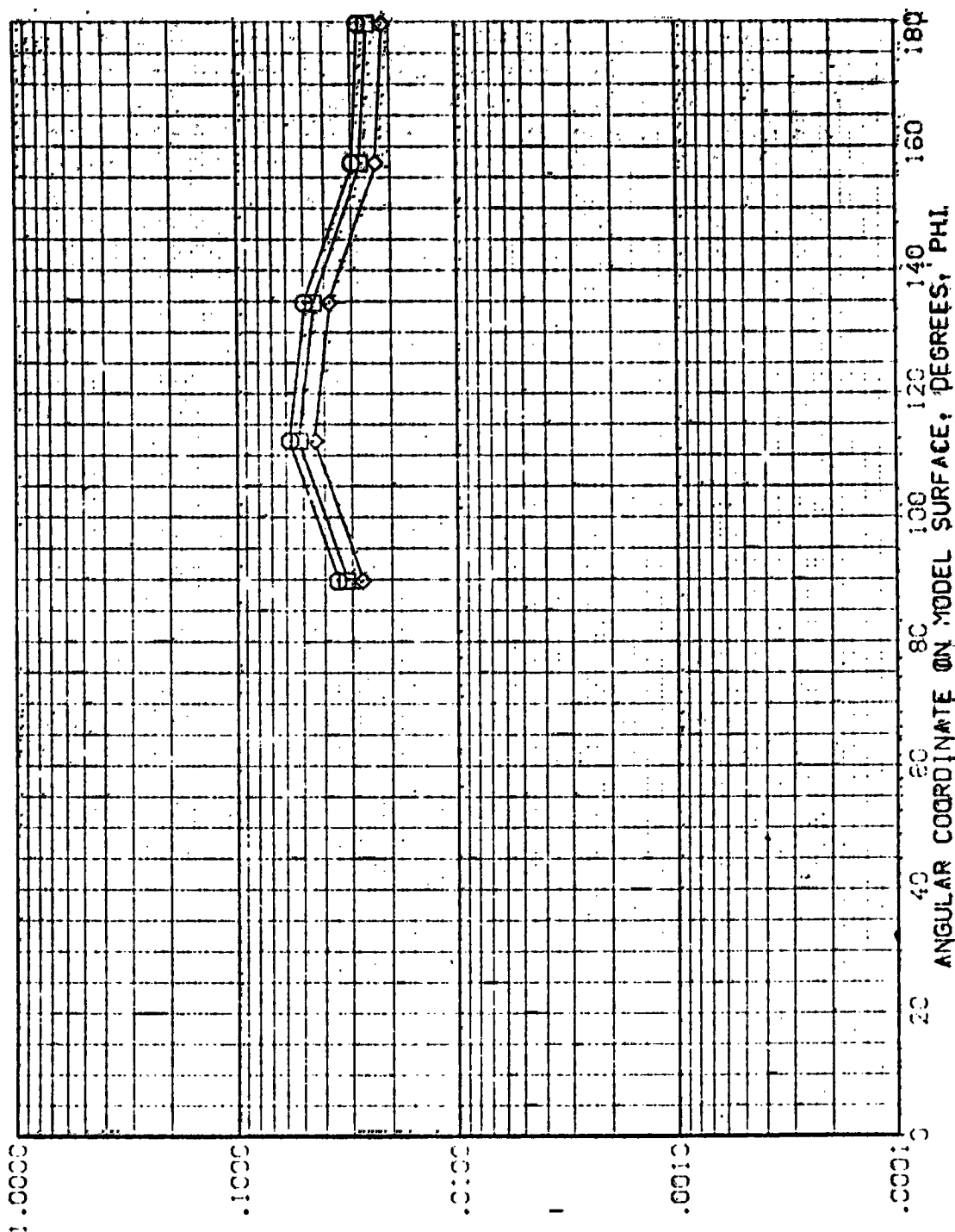


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T05)

SYNOPSIS

WAVELENGTH X/L MACH  
 .850 .550 5.221  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 120.080  
 R/L 1.030  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

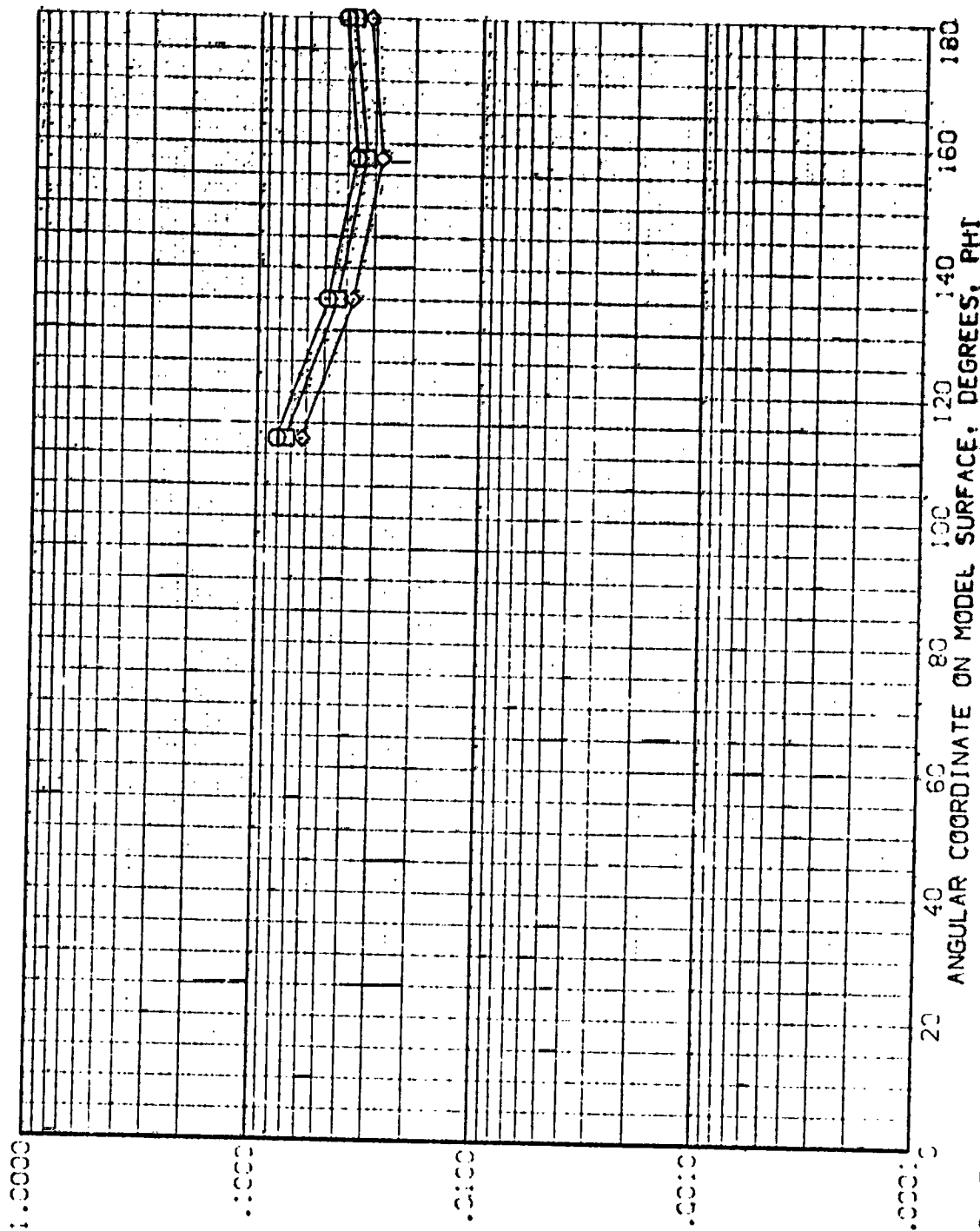


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 Q1+T1 EXTERNAL TANK

(REV T05)

SYNOPSIS

MAX/WT .850  
X/L .600  
YACH 5.221

PARAMETRIC VALUES  
A-PWA 120.000  
P-V/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

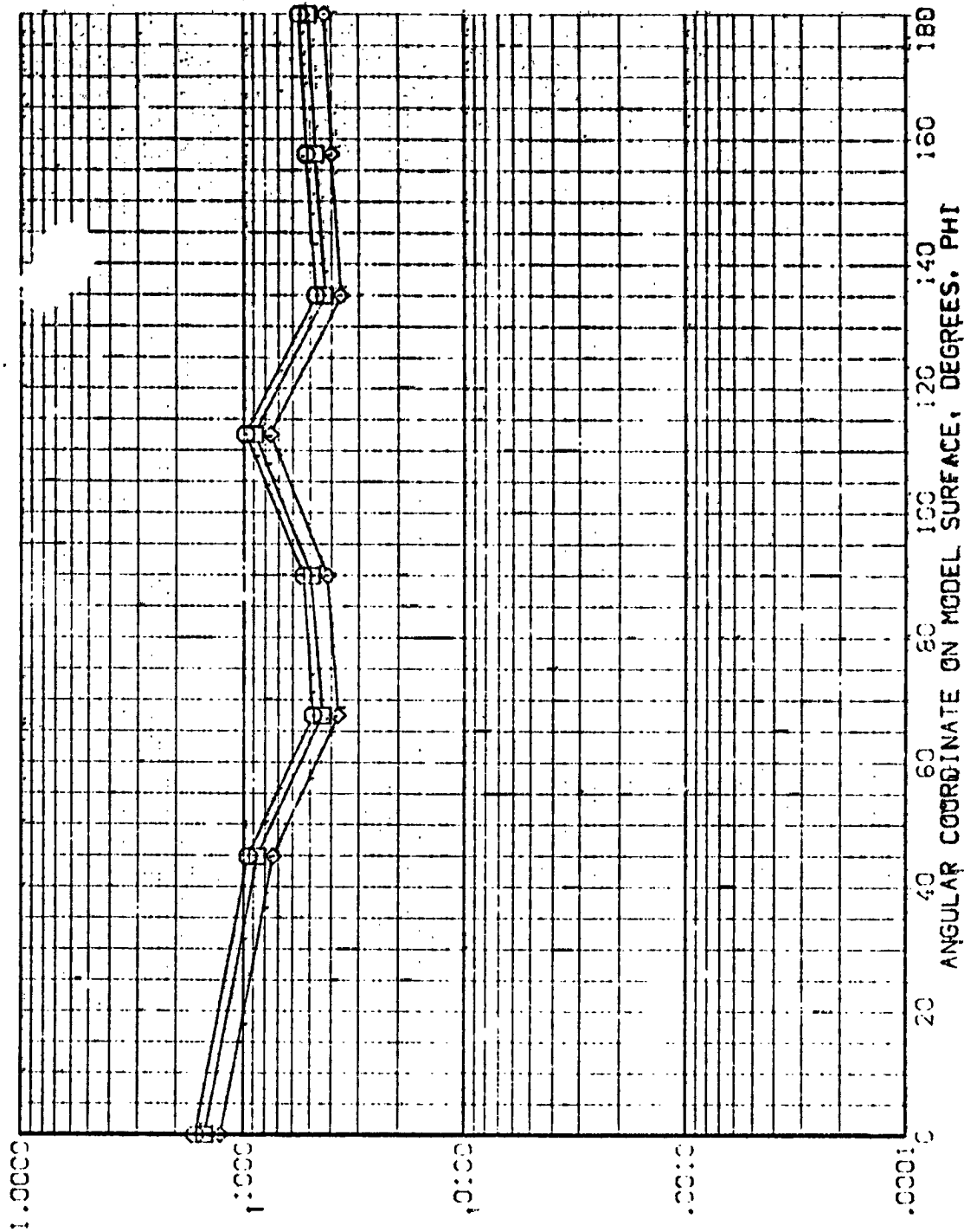


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+11 EXTERNAL TANK

(REV105)

◆ ELO  
SHEET

HEIGHT X/L MACH  
.850 .650 5.221  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 127.000 BETA .000  
PV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

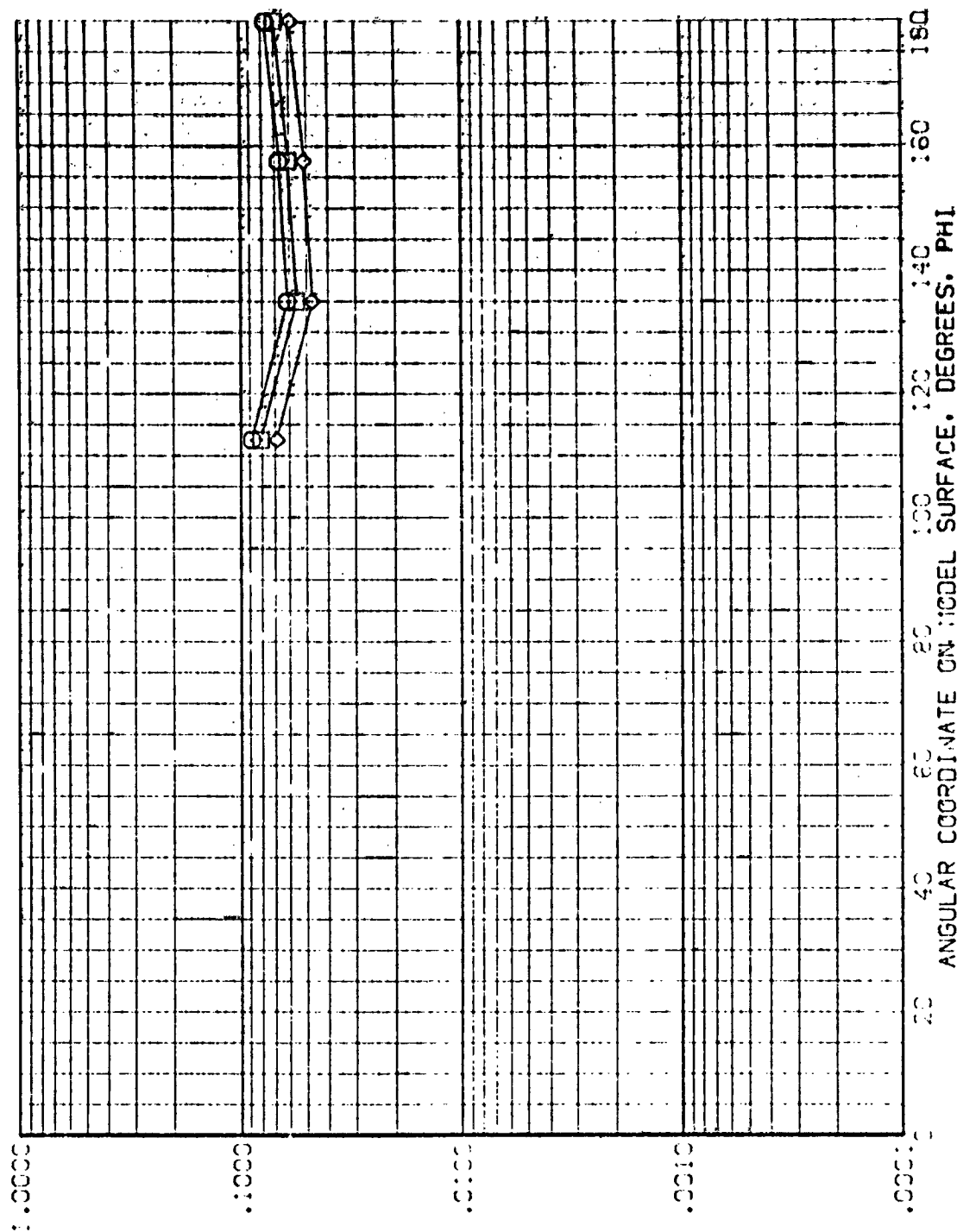


FIG. 5 TANK IN THE PRESENCE OF ORBITER



# YES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV105)

SVRCL  
WALL/FT  
.850  
.900  
1.000

K/L  
.700

WACH  
5.221

PARAMETRIC VALUES  
ALPHA  
120.000  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

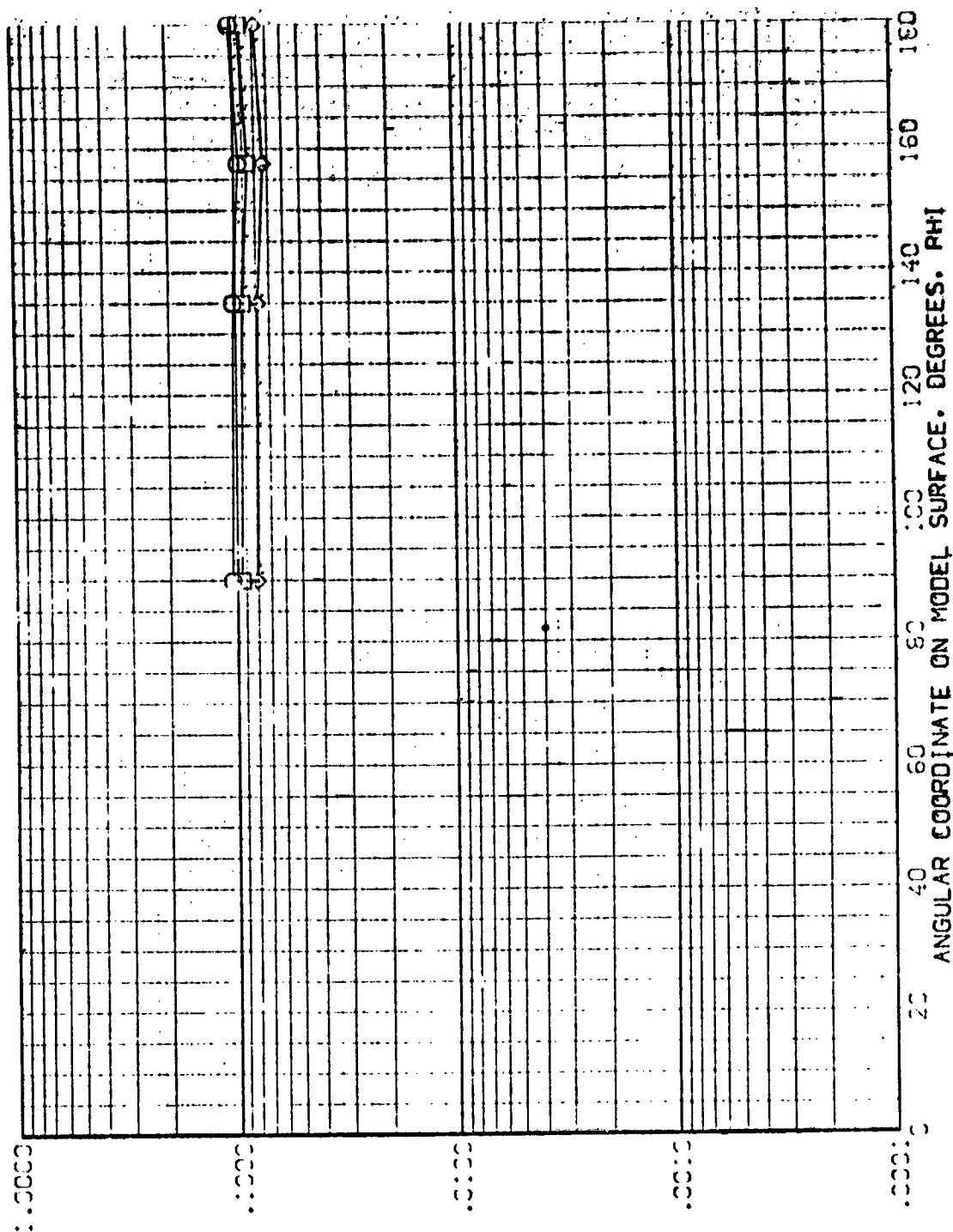


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1H28 01471 EXTERNAL TANK

(REV 05)

PARAMETRIC VALUES  
 A.P.A. 125.000 BETA .000  
 P.V.L. 1.000

VALUES  
 VACH 5.221  
 .850  
 .000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

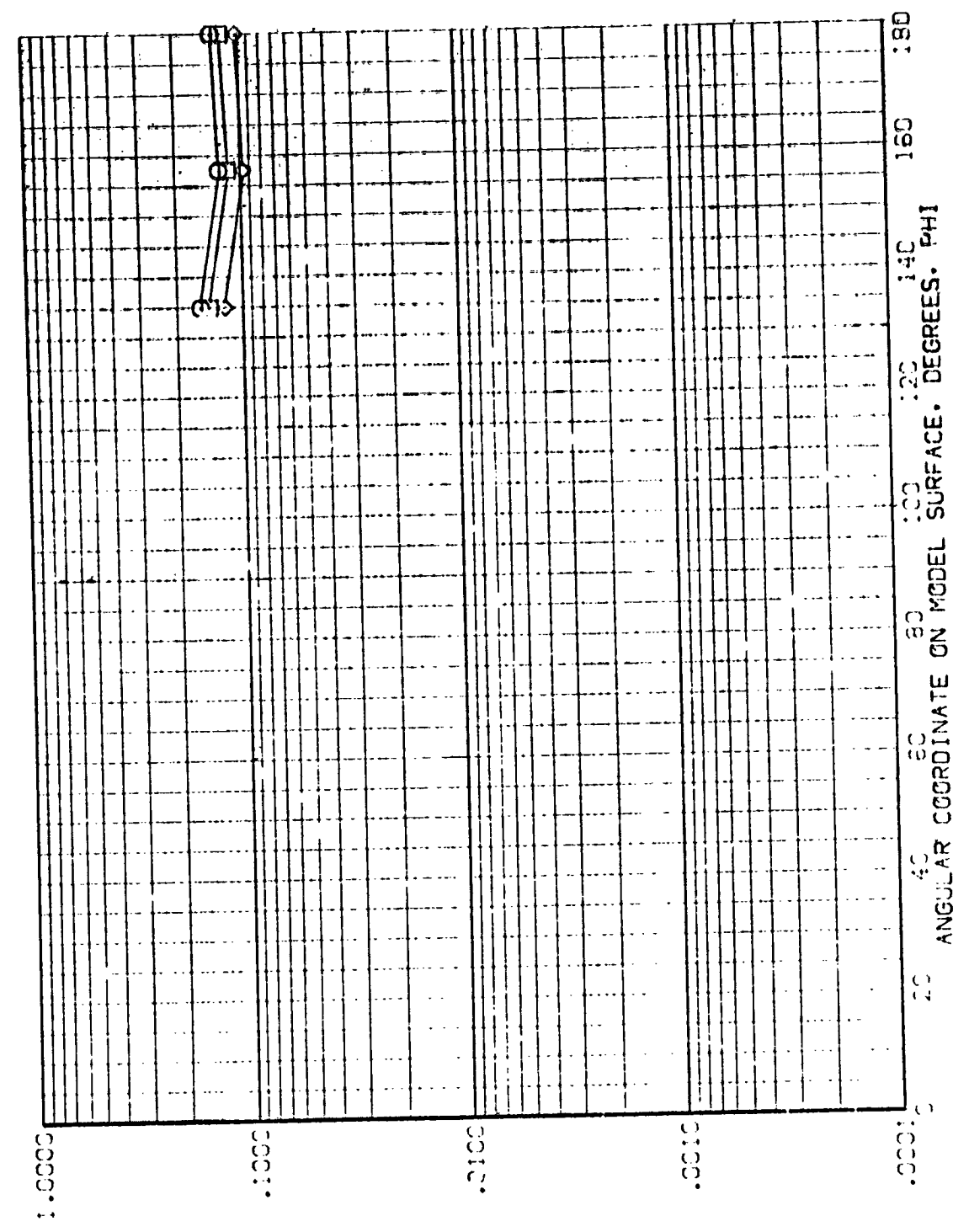


FIG. 5 TANK IN THE PRESENCE OF ORBITER

SAVE-  
OILIO

MACH  
X<sub>1</sub> MACH  
.850 5.221  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 12.000 BETA .000  
RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

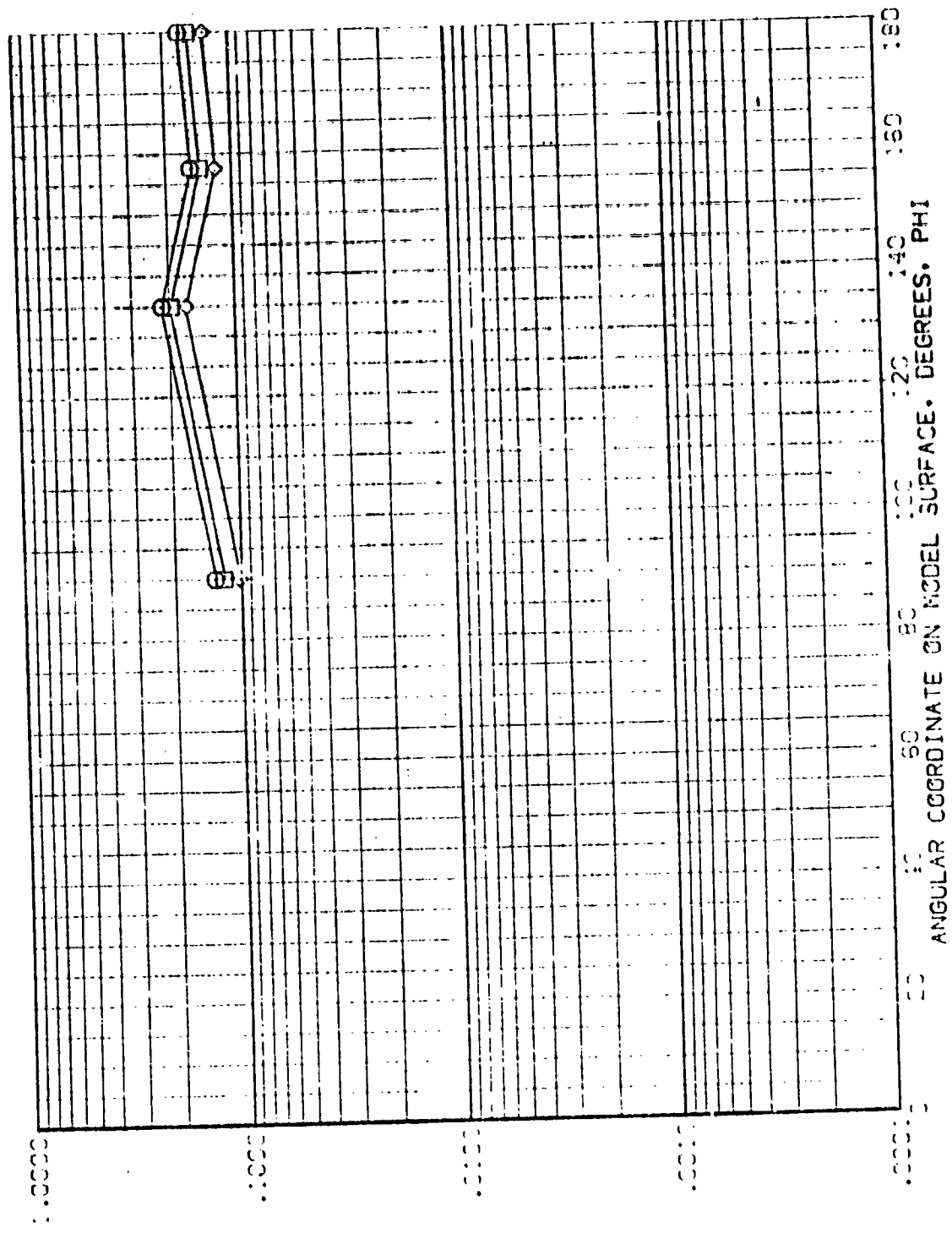


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1428 01411 EXTERNAL TANK

(REV105)

S-VEE H<sub>REF</sub> X/L MACH  
 .010 .000 .500 5.221  
 .000 .000 .000 1.000

PARAMETRIC VALUES  
 ALPHA 100.000 BETA .000  
 P<sub>W/L</sub> 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

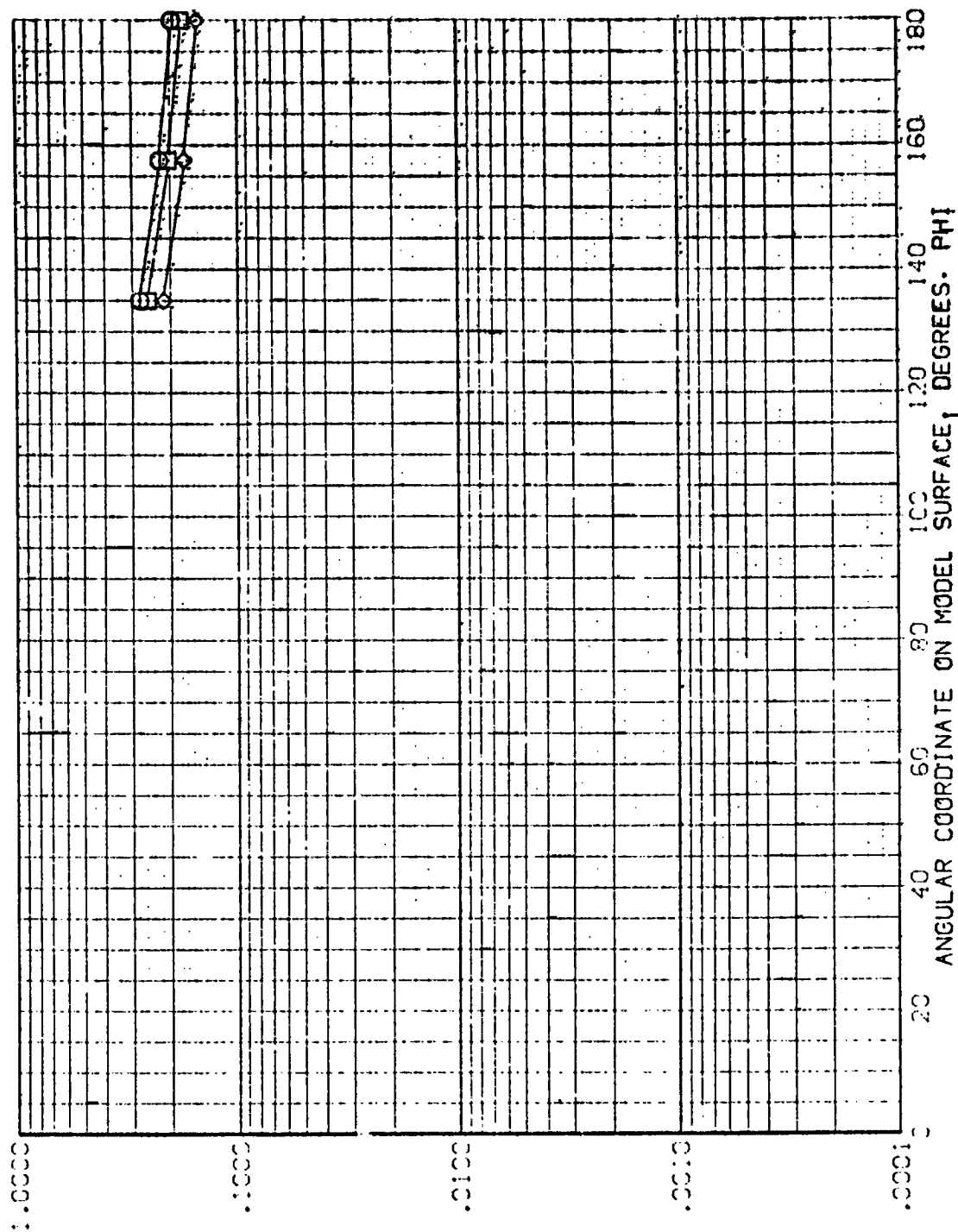


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T05)

SYMBOL  
 1.000  
 .900  
 .800  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 .000

Y/L MACH  
 .900 5.221

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

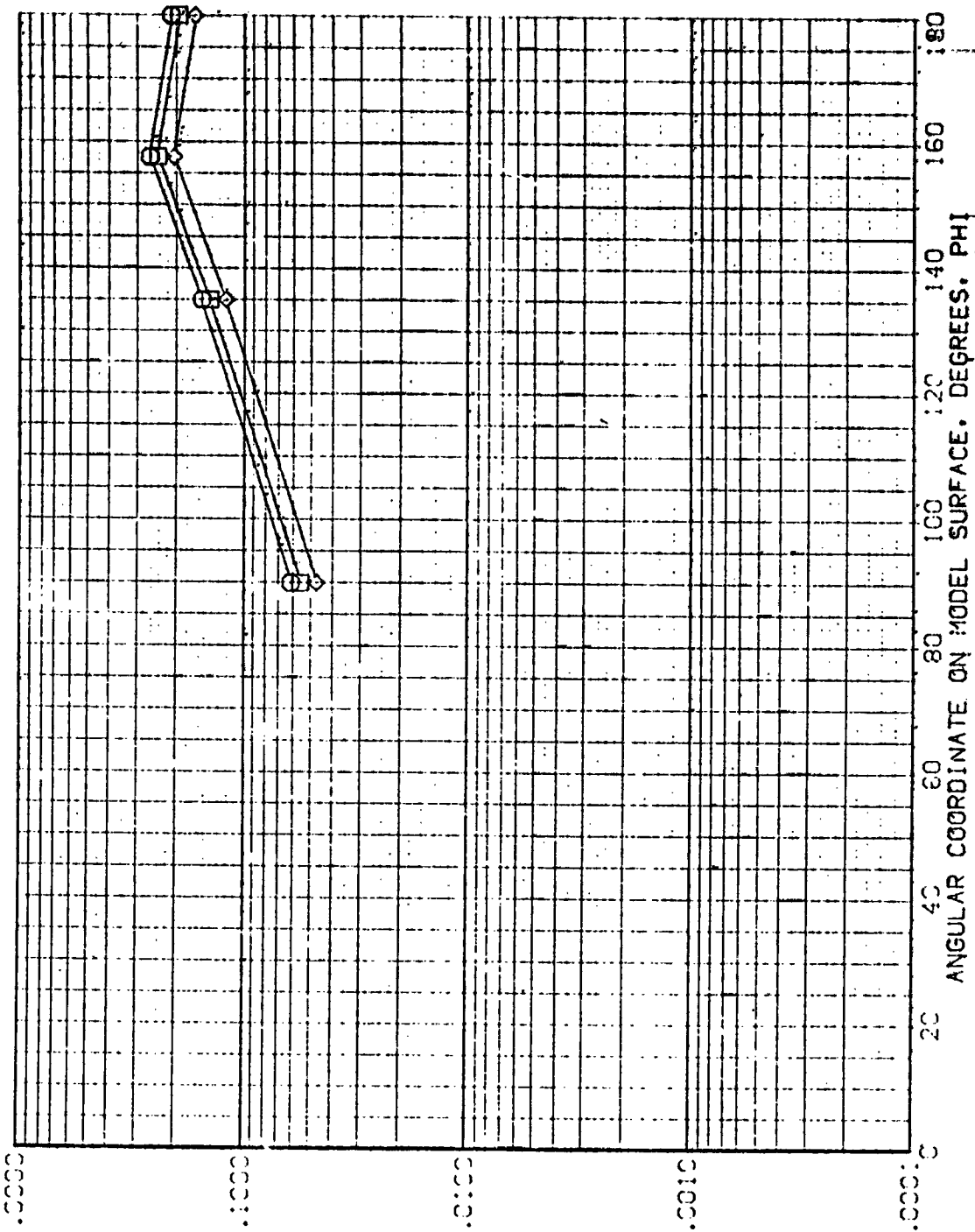


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3,5-195 1428 01+T1 EXTERNAL TANK

(REV106)

SYMBOL     $H_A/H_{REF}$      $X/L$      $YAC/L$      $ALPHA$      $RN/L$      $PARAMETRIC VALUES$      $BETA$      $0.000$

□    .650    .350    5.220    -120.000    1.000

◇    .900    .350    5.220    -120.000    1.000

◇    1.000    .350    5.220    -120.000    1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

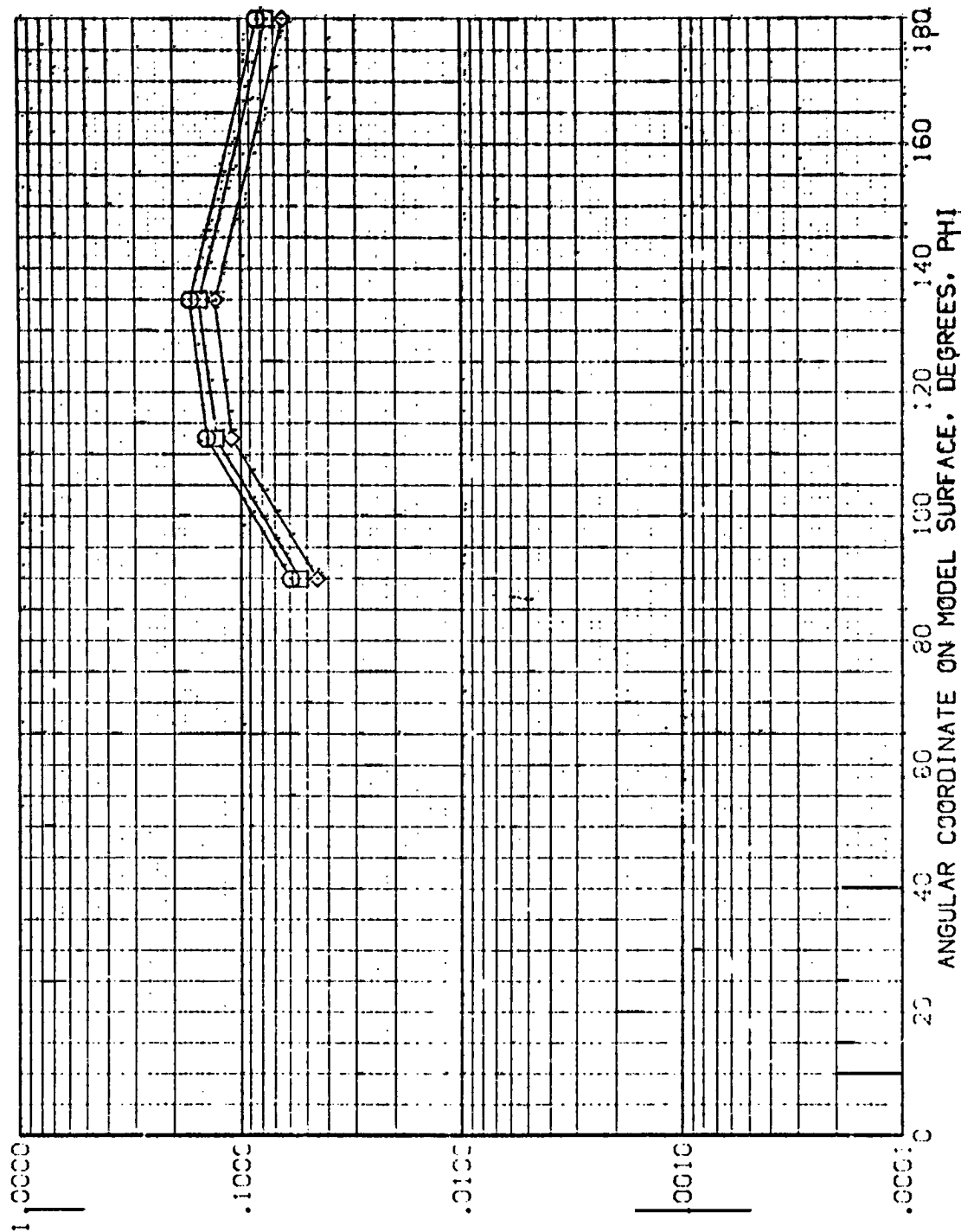


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV T06)

SYMBOL

HAU/HT

X/L

MACH

ALPHA

BETA

RI/L

PARAMETRIC VALUES

-120.000

1.000

0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

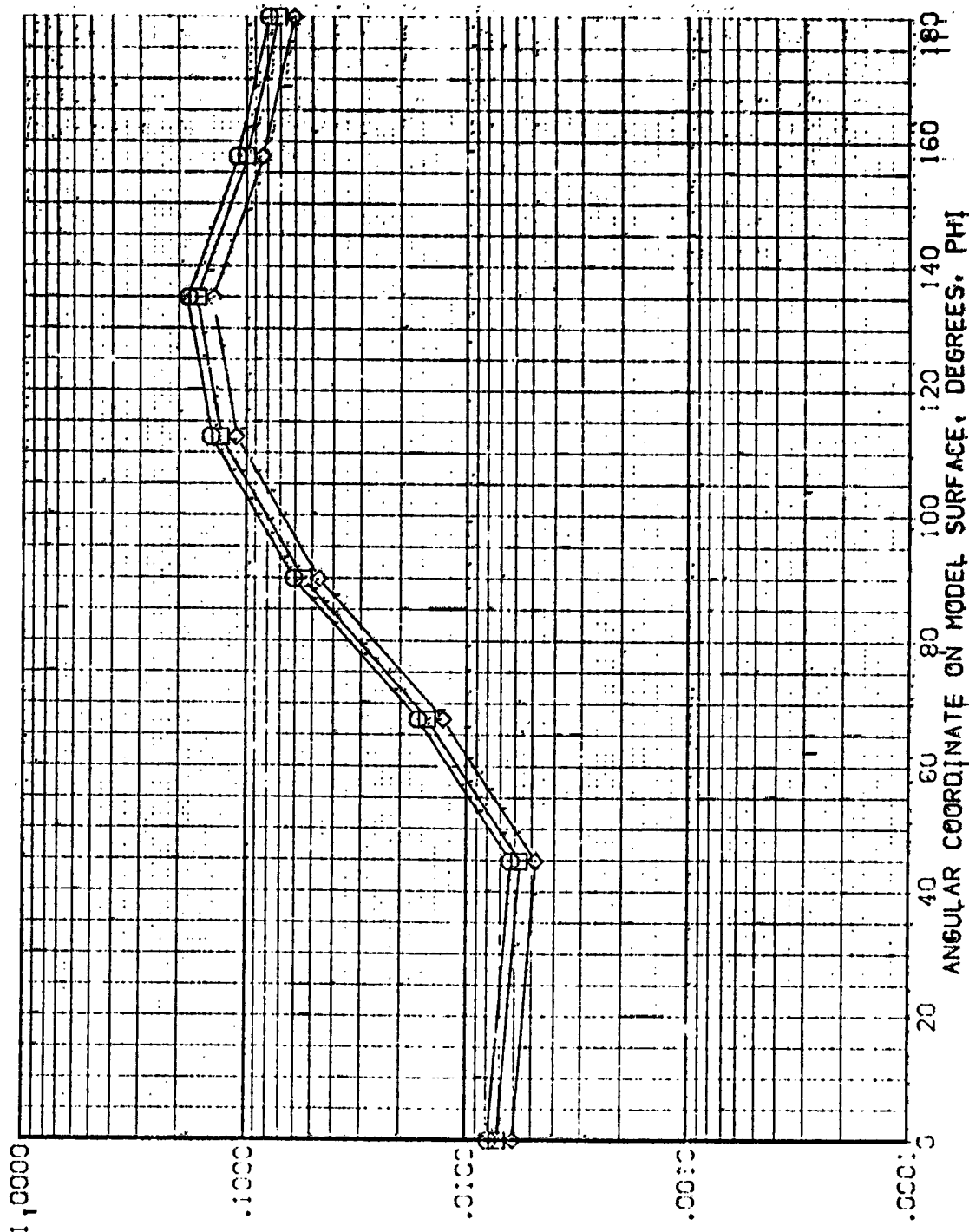


FIG. 5 TANK IN THE PRESENCE OF ORBITER

# AXES 3.5-195 IH28 G1+T1 EXTERNAL TANK

(REV T06)

SYMBOL	PARAMETER	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	0.850	0.450	5.273	-120.000	0.000
□	0.900			0.000	0.000
◇	1.000			0.000	0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

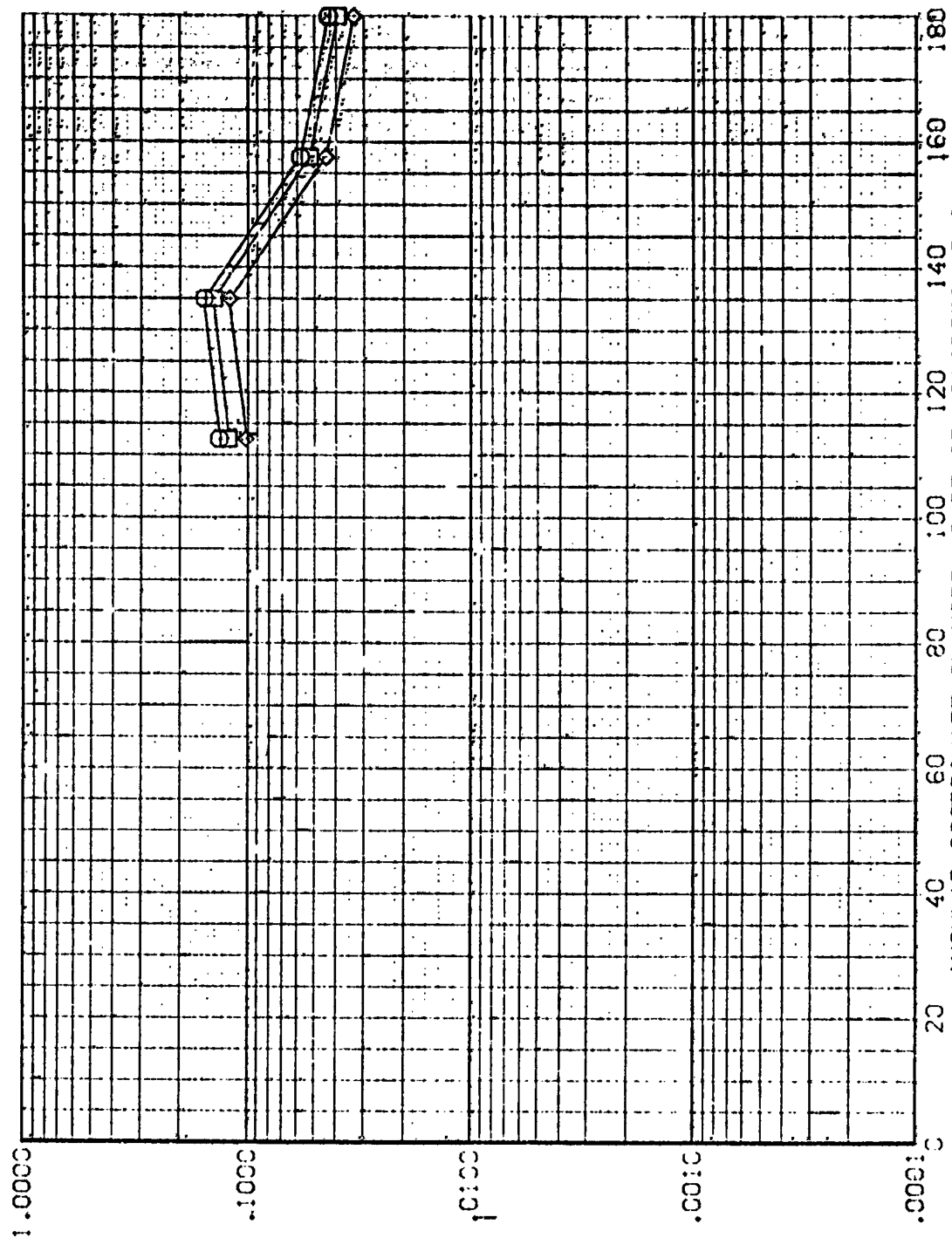


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



SV/REF  
 .850  
 .900  
 1.000

X/L  
 .500

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -120.000  
 1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

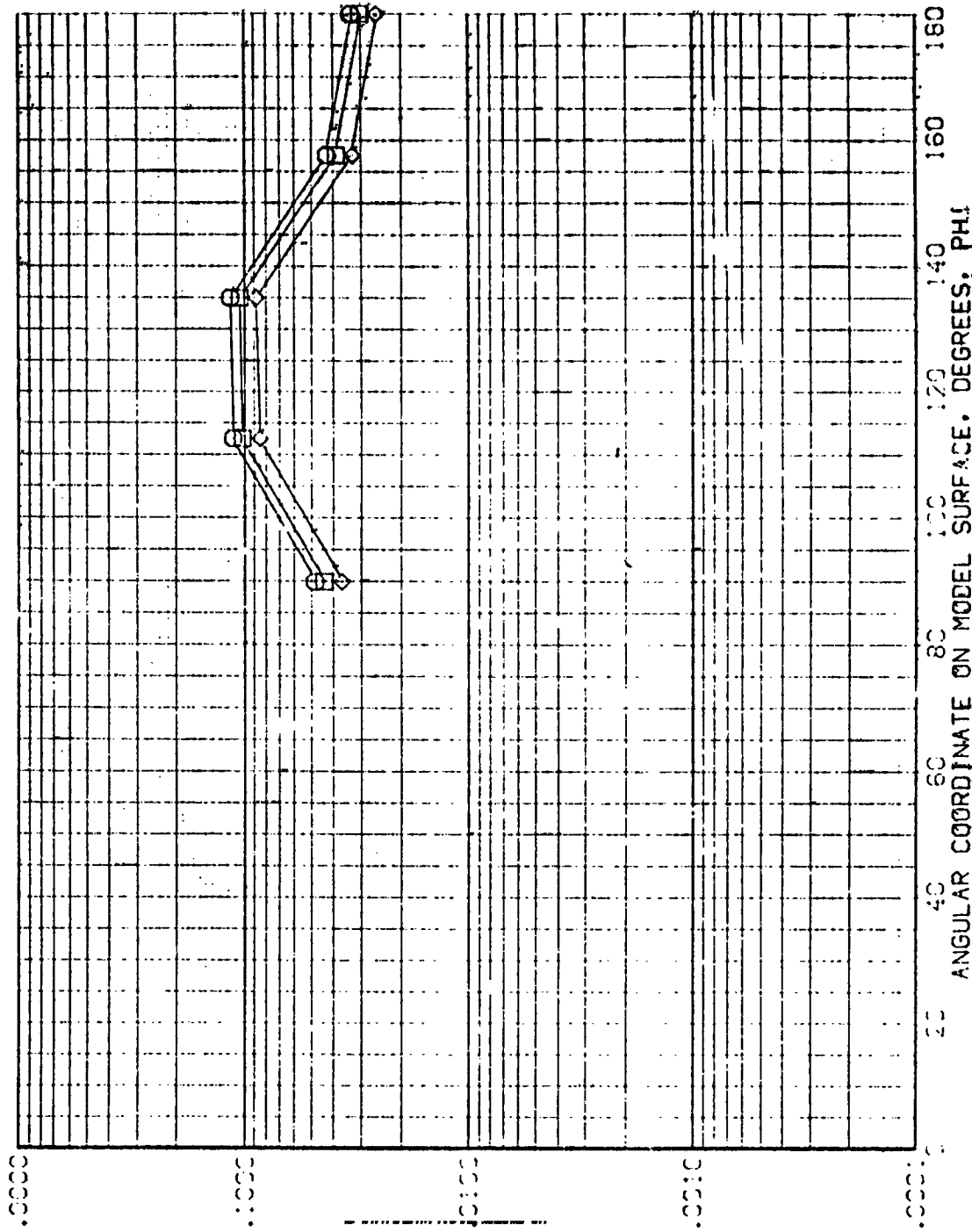


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AXES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV T06)

SYMBOL  
 1.000  
 .850  
 .550  
 .220

Y/L  
 .550  
 .220

PARAMETRIC VALUES  
 ALPHA  
 -120.000  
 BETA  
 11.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

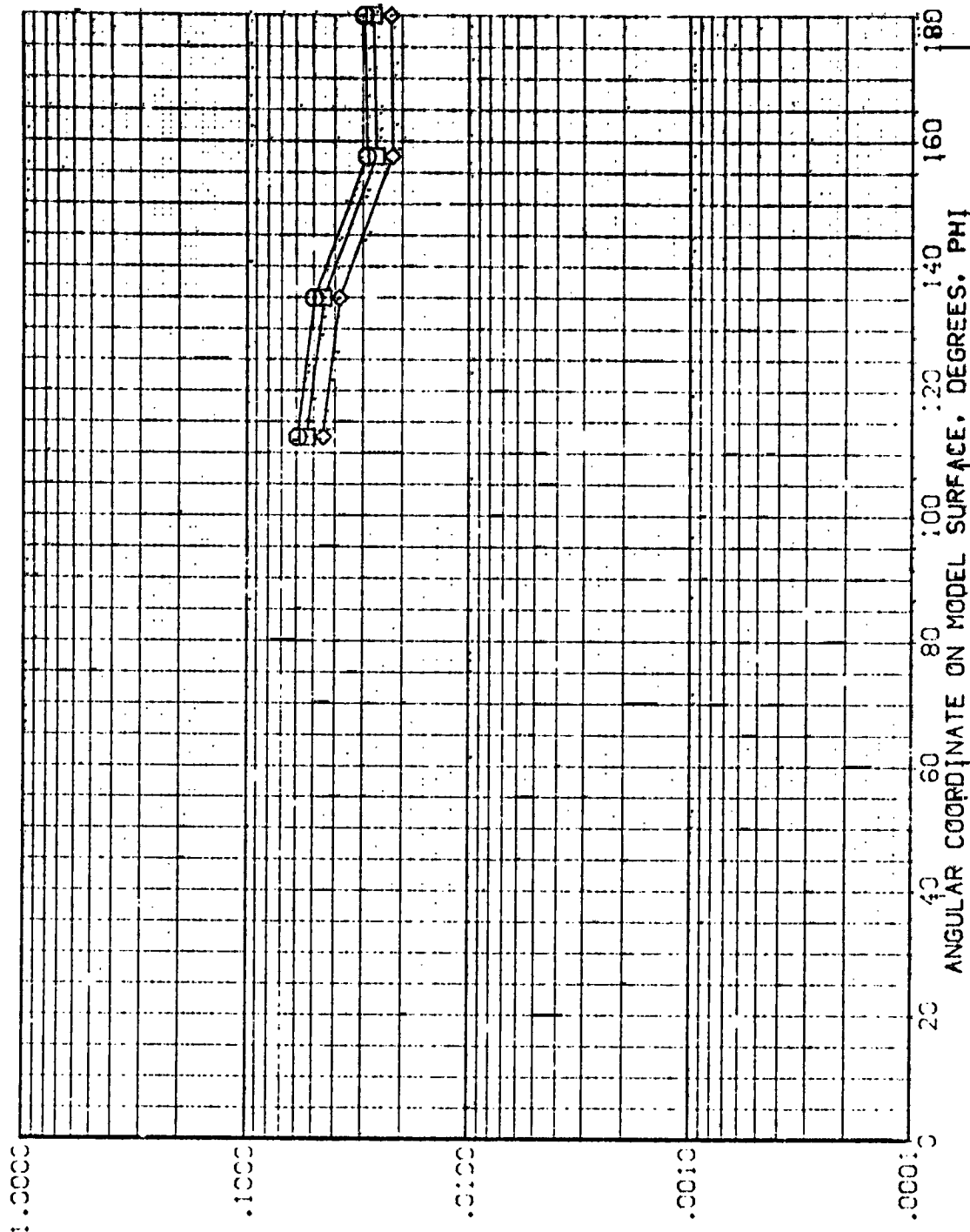


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AXES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T06)

SYMBOLS  
 ◇ OPEN  
 ◻ FILL

HA/H<sub>REF</sub>  
 .850  
 .900  
 1.000

X/L  
 .600

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA 1.000  
 PNU/1 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

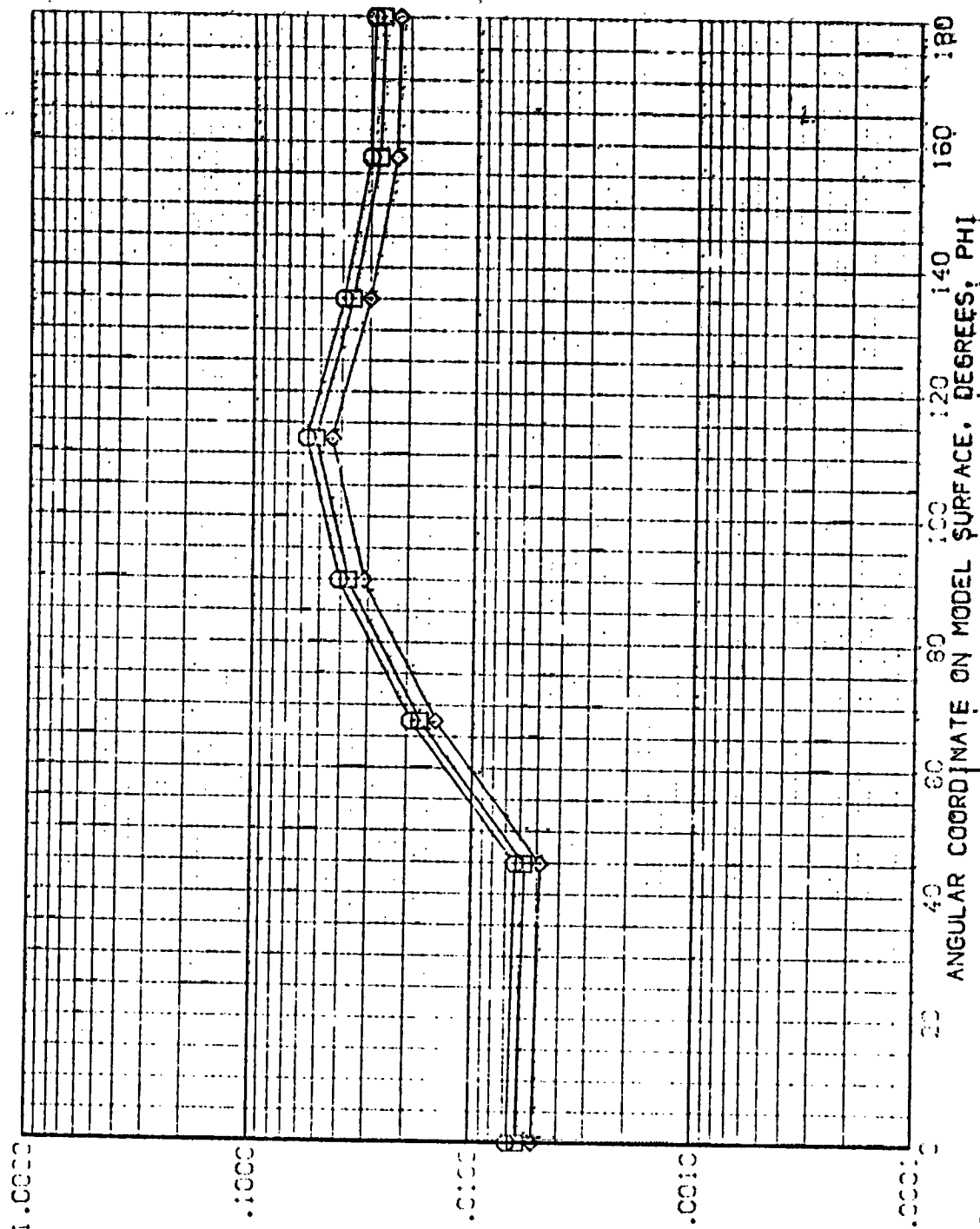


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T06)

$\Delta$  1.000  
 1.000  
 .850  
 .650  
 .450  
 .250  
 .050  
 0.000  
 X/L .650  
 MACH 5.220

PARAMETRIC VALUES  
 ALPHA 1120.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

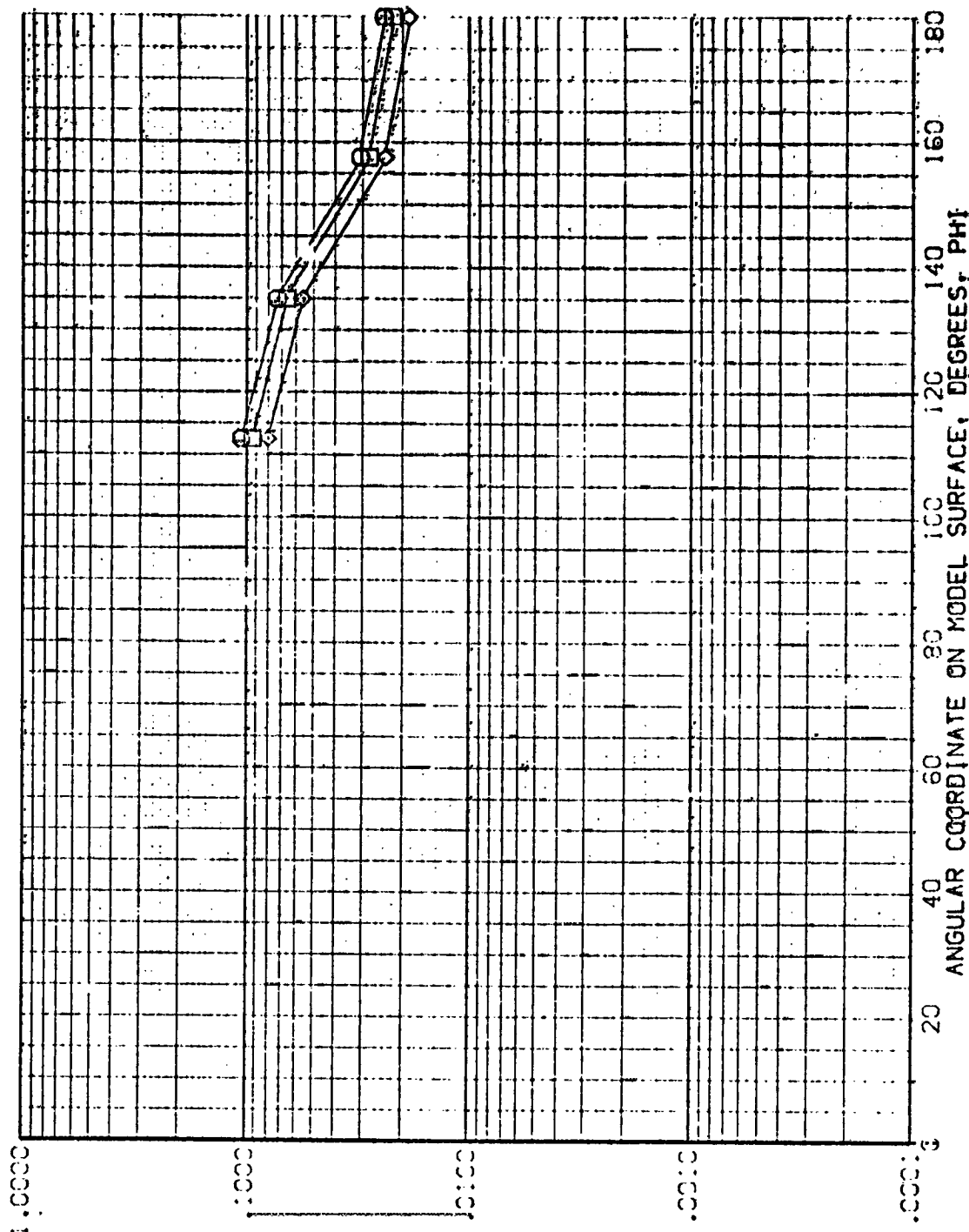


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV106)

SYMBOL H/W/T X/L MACH  
 ◇ .850 .700 5.220  
 ○ .900 .900  
 □ 1.000

PARAMETRIC VALUES  
 ALPHA -127.000 BETA .000  
 RM/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

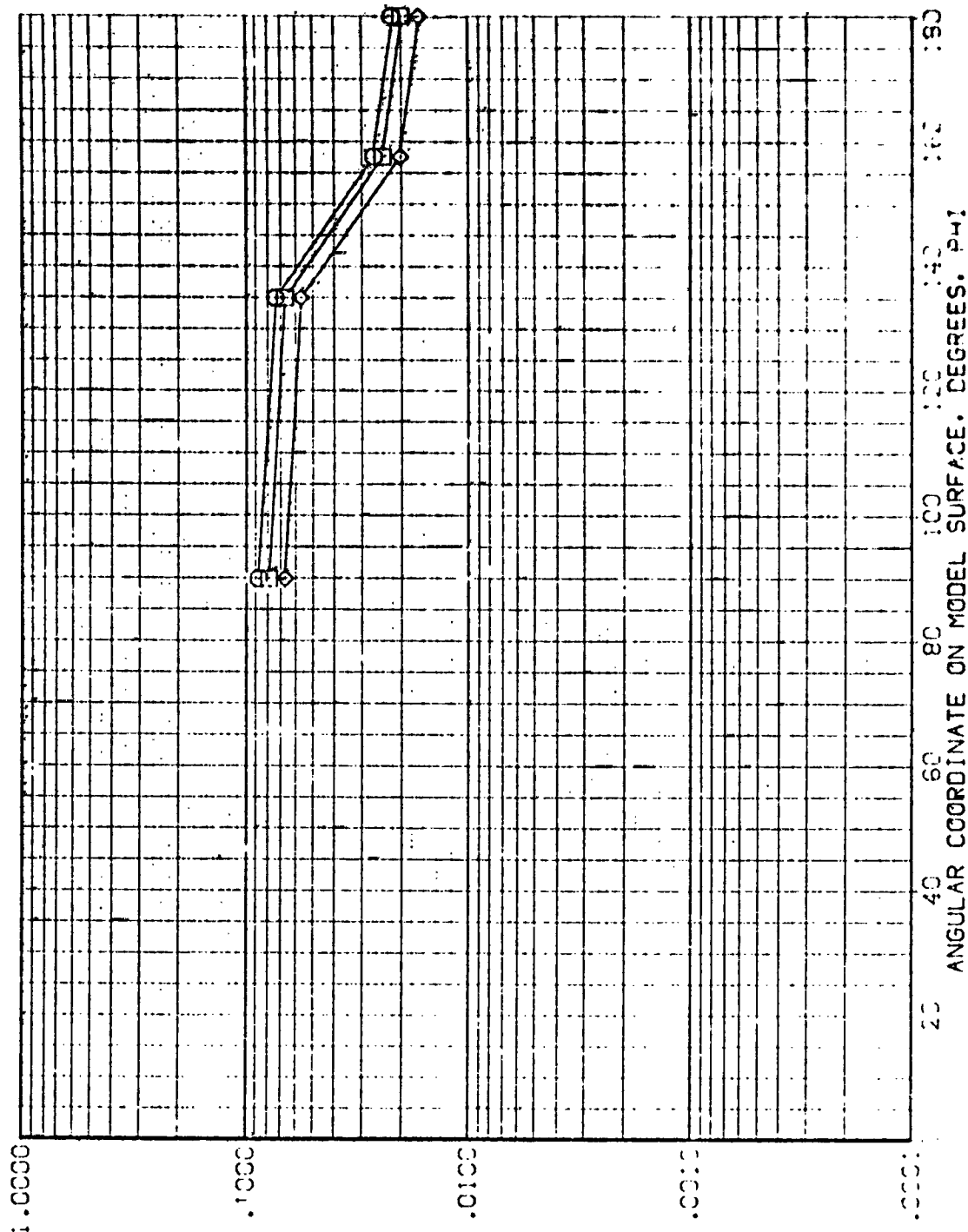


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV706)

SVEZL 4.800  
 1.850  
 1.900  
 1.000  
 1.750  
 5.220  
 VACH

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA .800  
 RN/L : 500

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

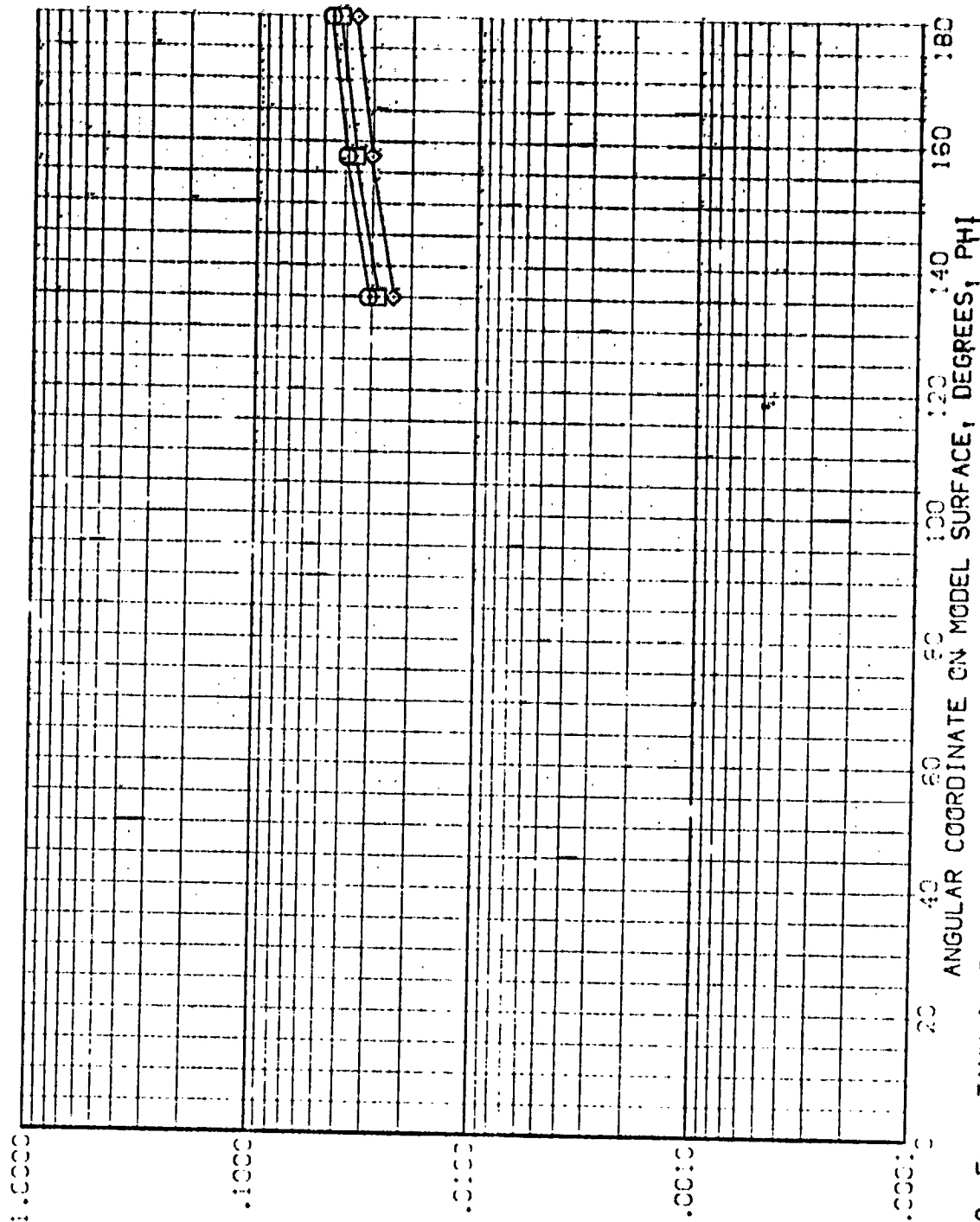


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+11 EXTERNAL TAN:

(REV106)

SYMBOL

WALL/HT  
.850  
.900  
1.000

X/L  
.800

MACH  
5.220

PARAMETRIC VALUES  
ALPHA -120.000 BETA  
RW/L 1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

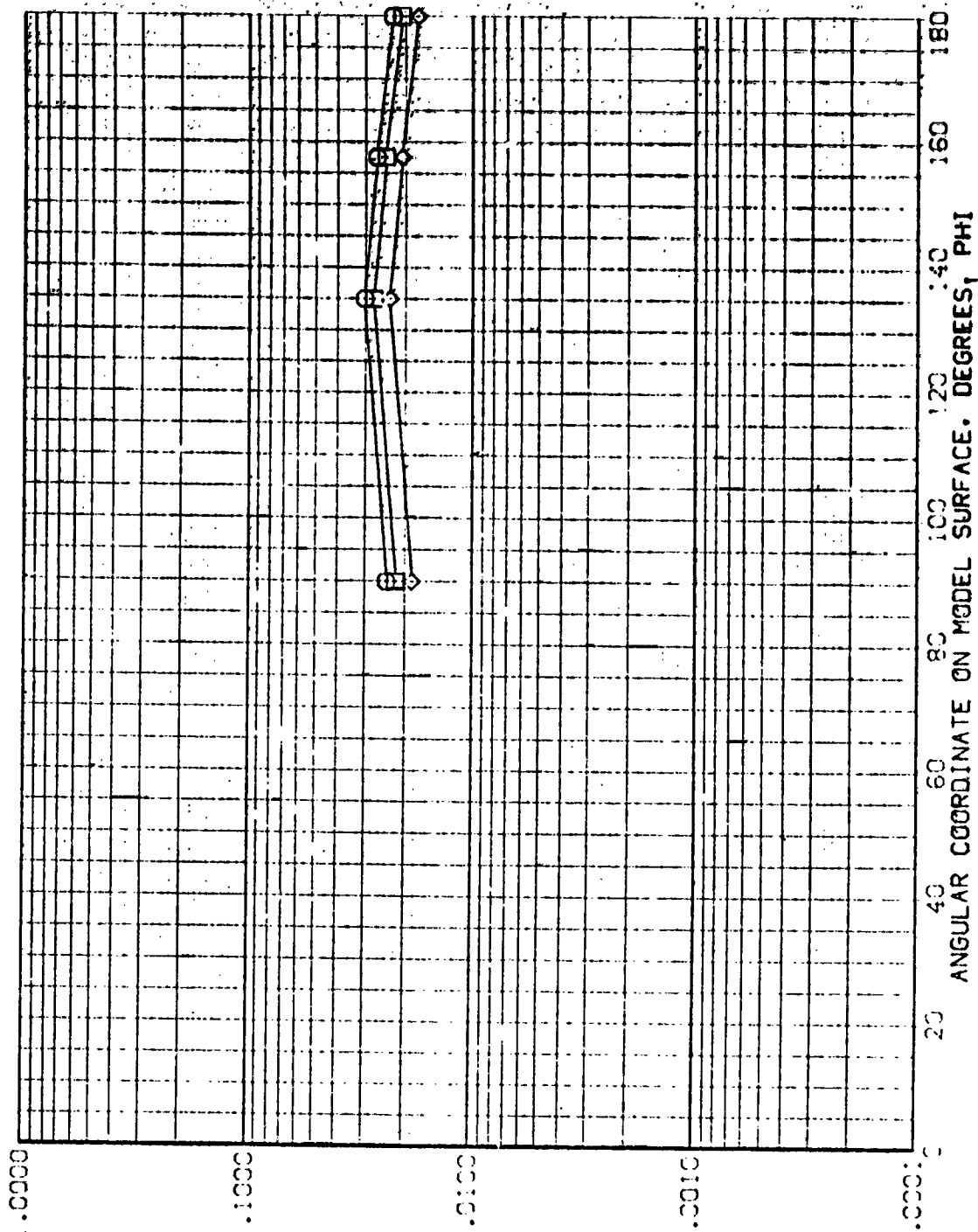


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

RECEIVED  
JAN 10 1968  
AEC

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REVTC6)

SWEEP- H/W/LT X/L MACH  
 .850 .550 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

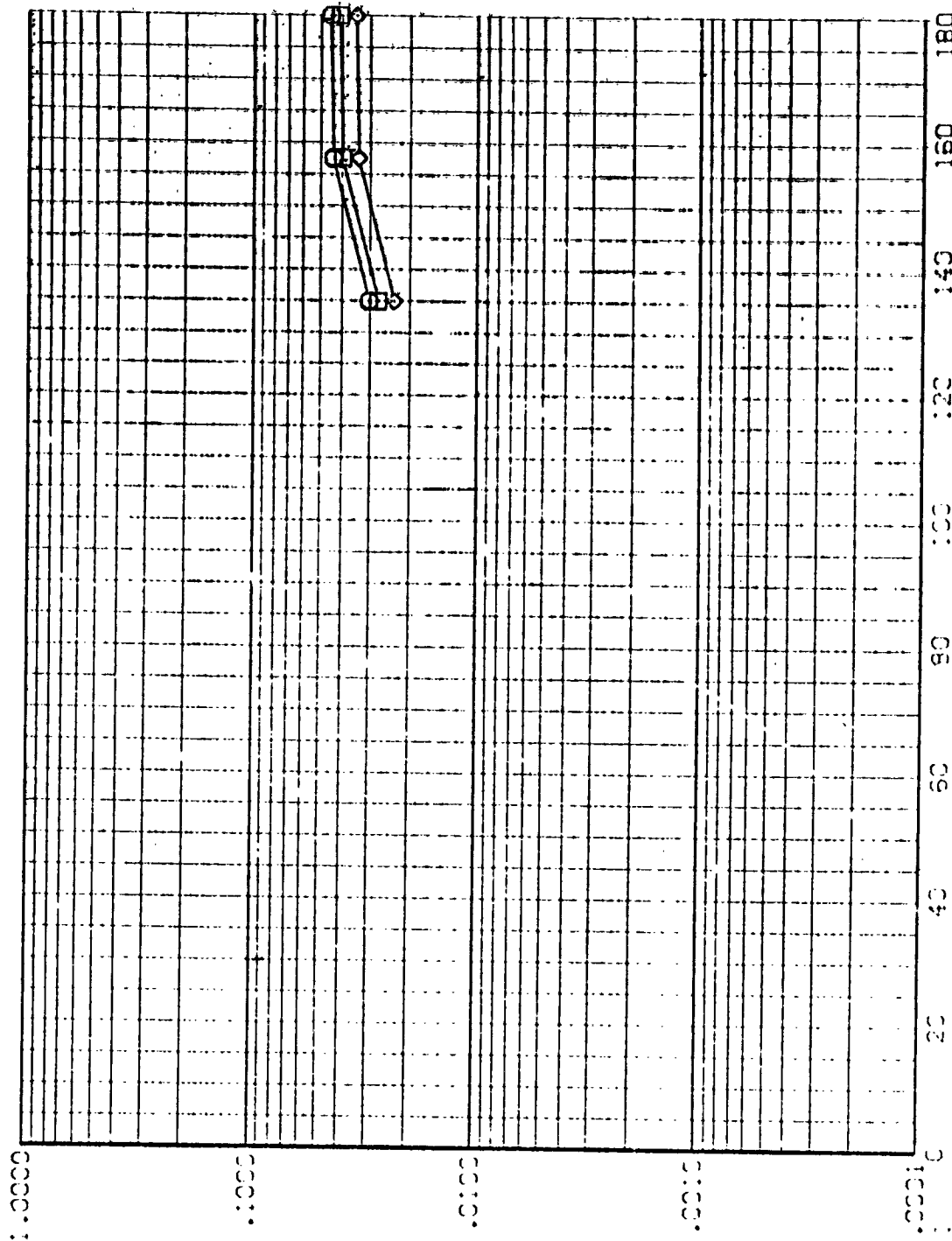


FIG. 5 TANK, IN THE PRESENCE OF ORBITER  
 ANGULAR COORDINATE ON MODEL SURFACE, DEGREES, PHI



AMES 3.5-195 H28 01+T1 EXTERNAL TANK

(REVISED)

SWELL -As/m- X/L MACH  
 .850 .900 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA  
 RV/L 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

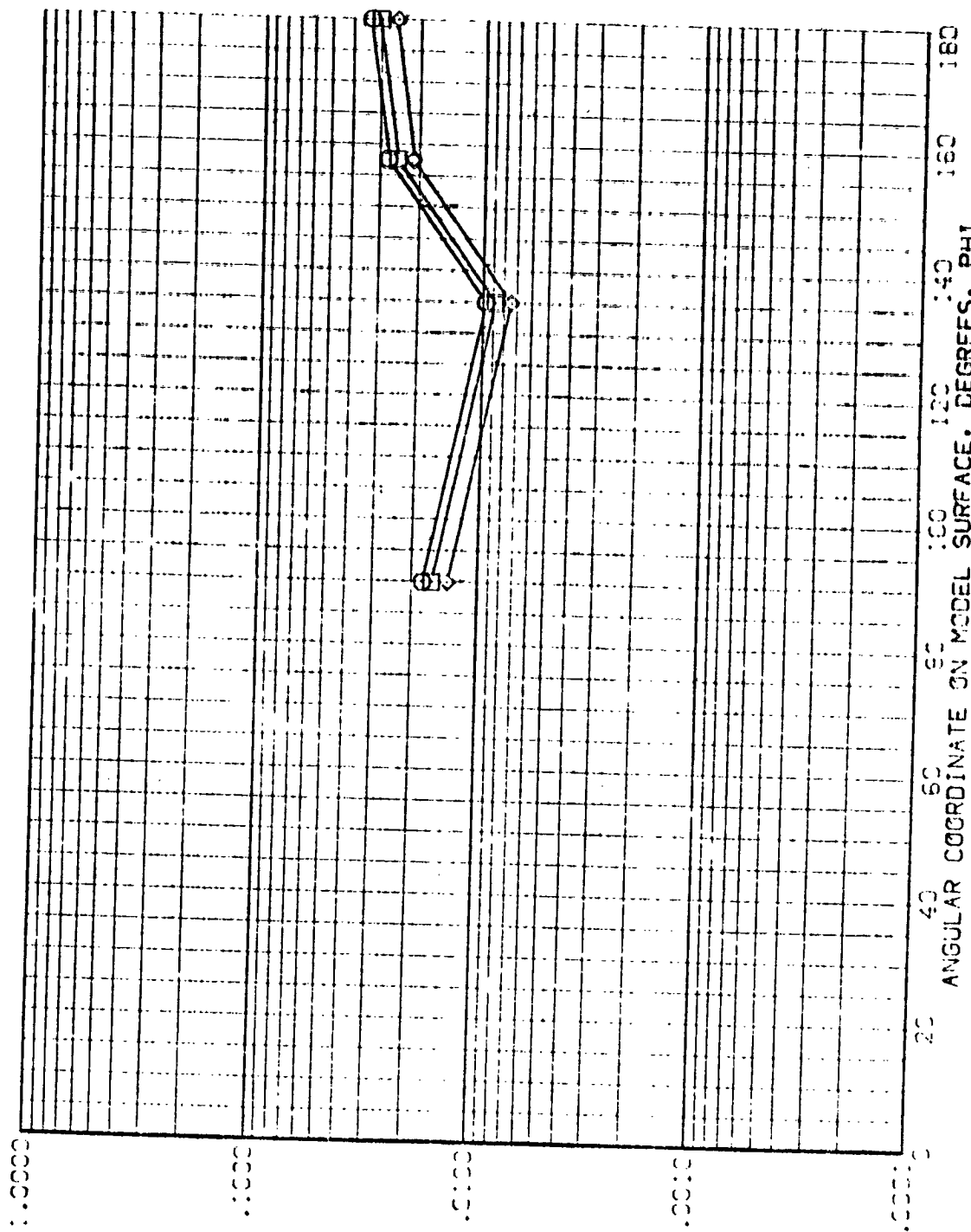


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T07)

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 R<sup>2</sup>/L 1.000

SYMBOL H/W/L X/L MACH  
 ◇ .850 .350 5.219  
 □ .900 .350 5.219  
 ○ 1.000 .350 5.219

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

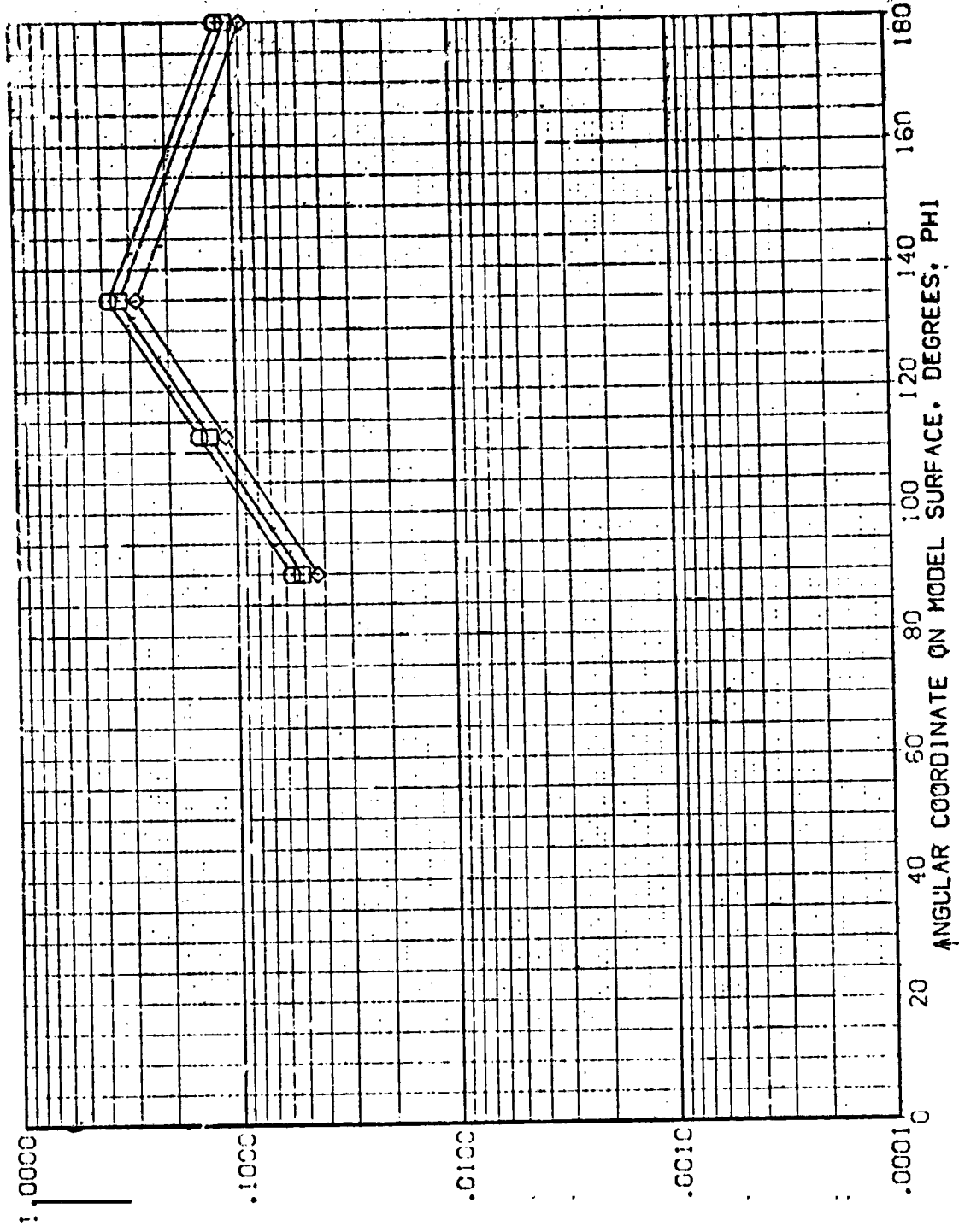


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL

W/W<sub>0</sub> Y/L MACH  
 .850 .400 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RH/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

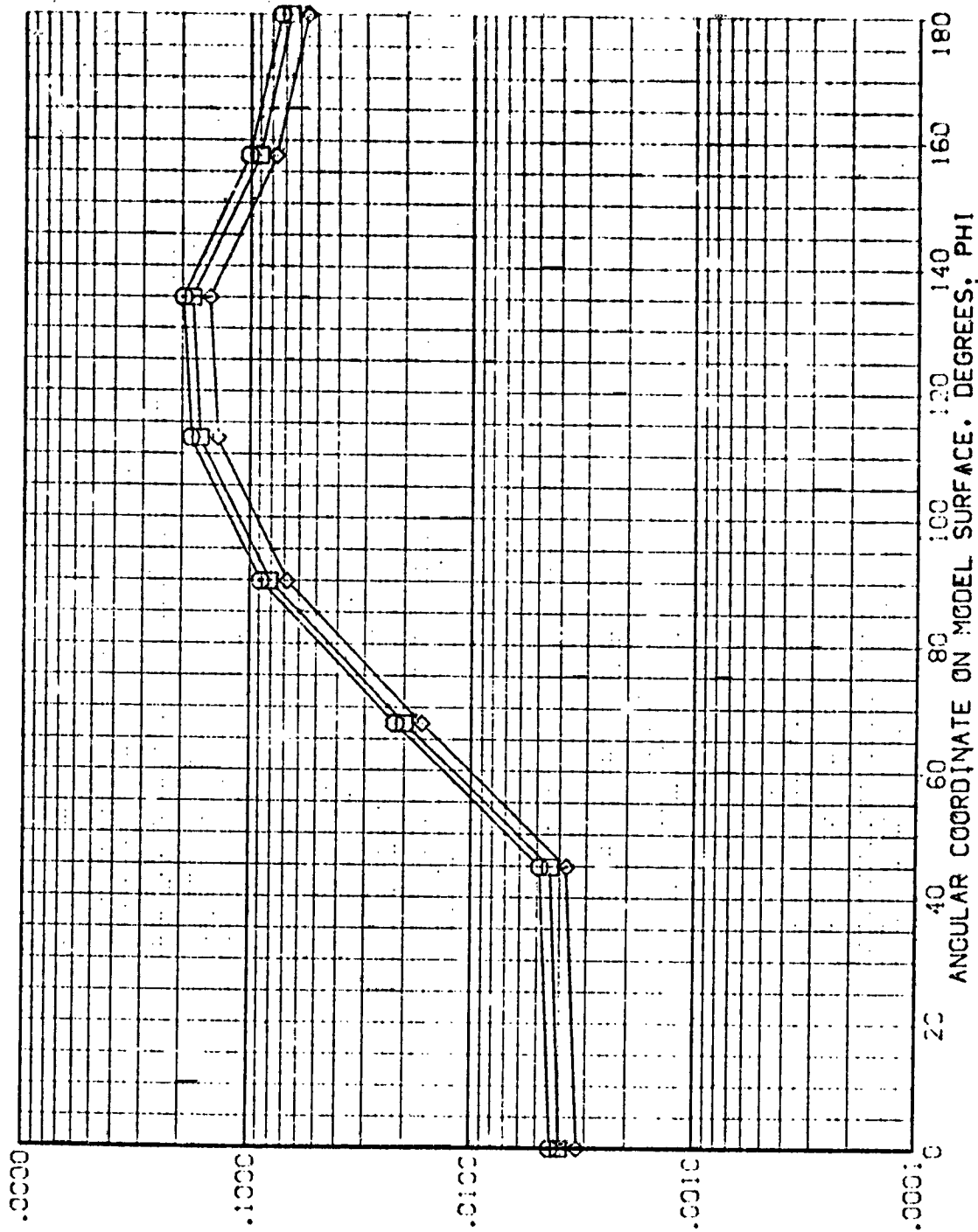


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV107)

SWR-  $W/H$  X/L MACH  
 .850 .450 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

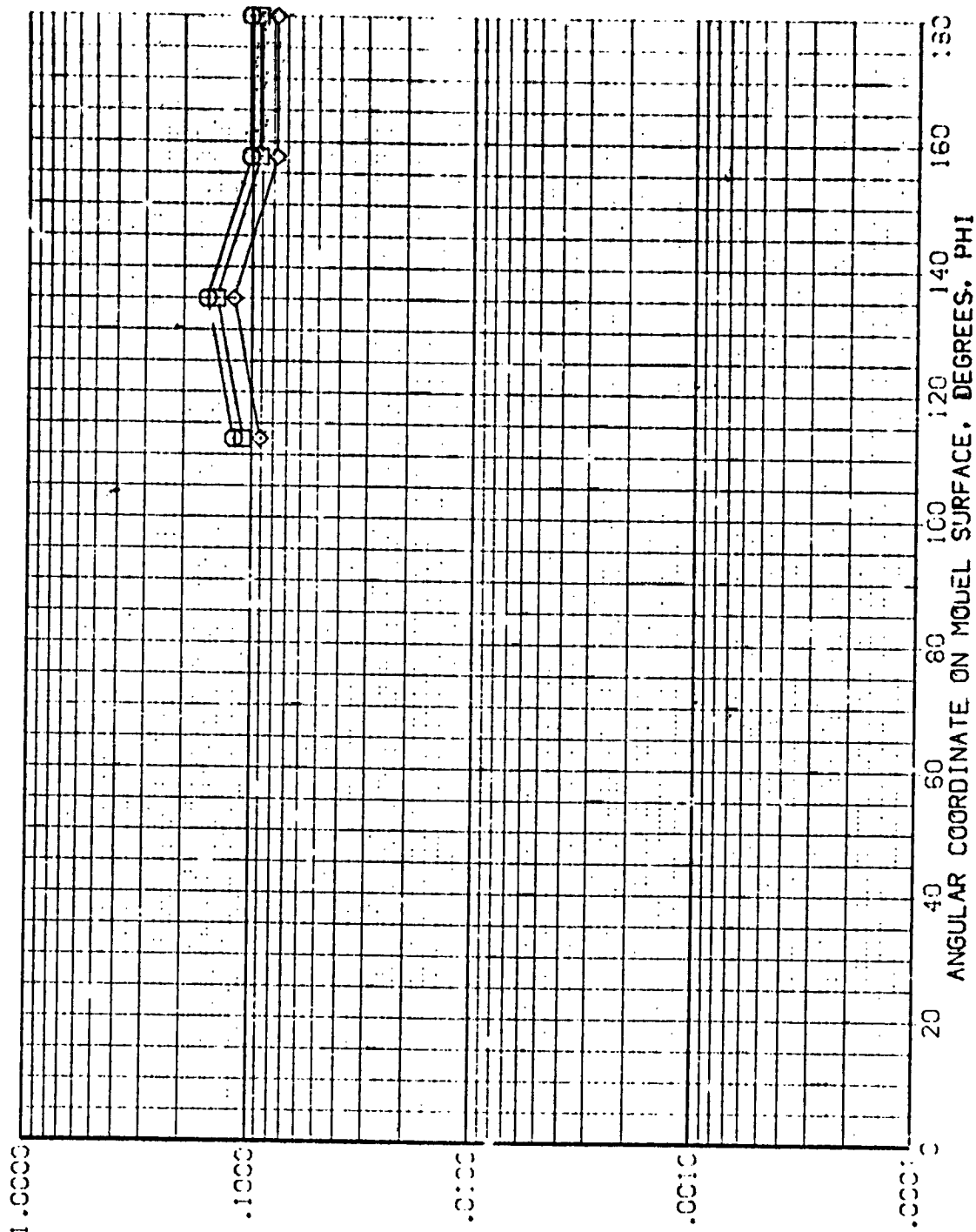


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T07)

SYMBOL  
 □  
 ◇  
 1.000

HAW/HT X/L MACH  
 .850 .500 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RV/L 1.000

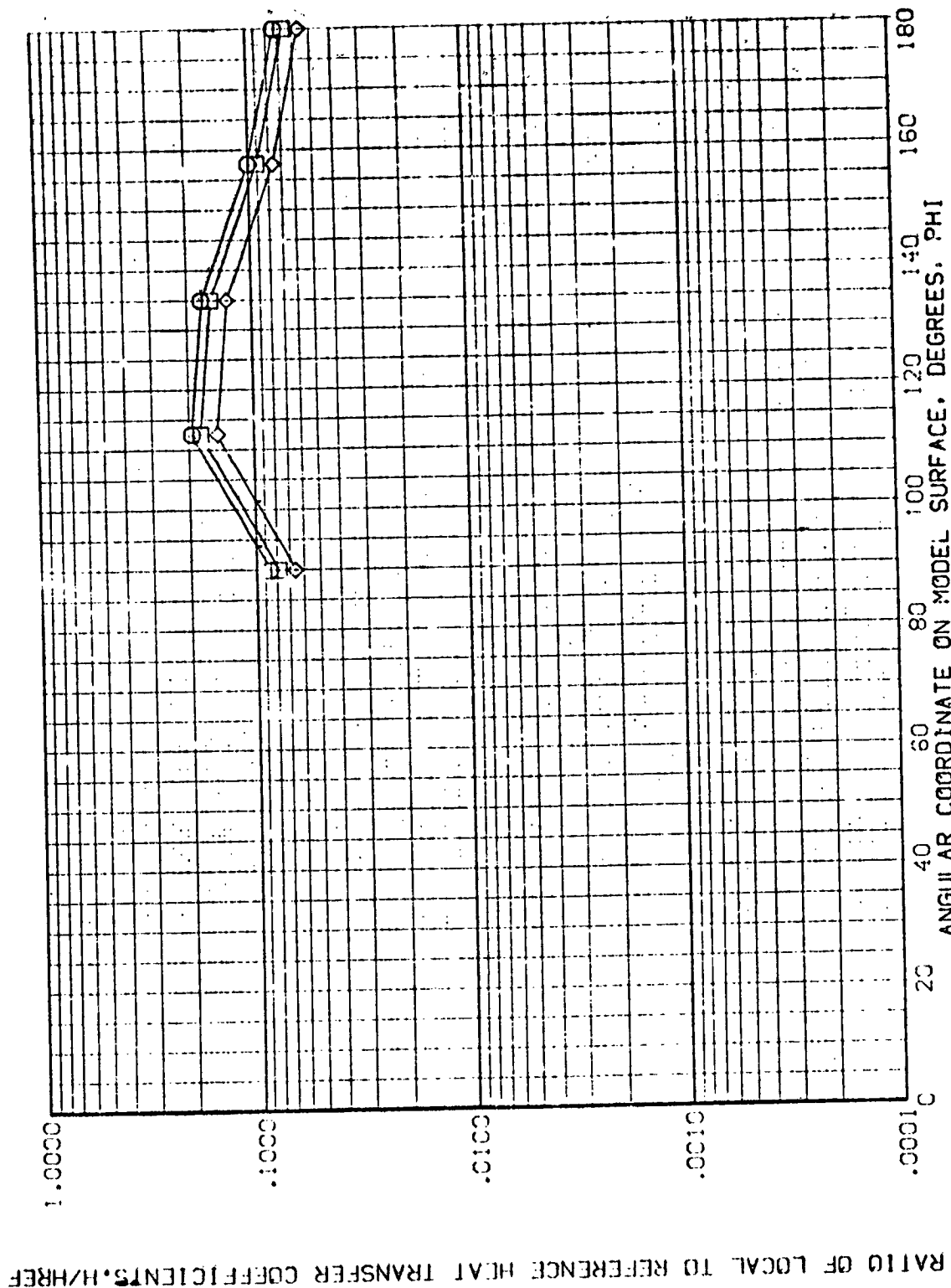


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV107)

**5**

1. 17/12/1994

22

200

75.

(1)  
15  
16  
17

## 5.219

### PARAMETRIC VALUES

0001.000 BETA

**ALPHA**

0000-1

000.

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

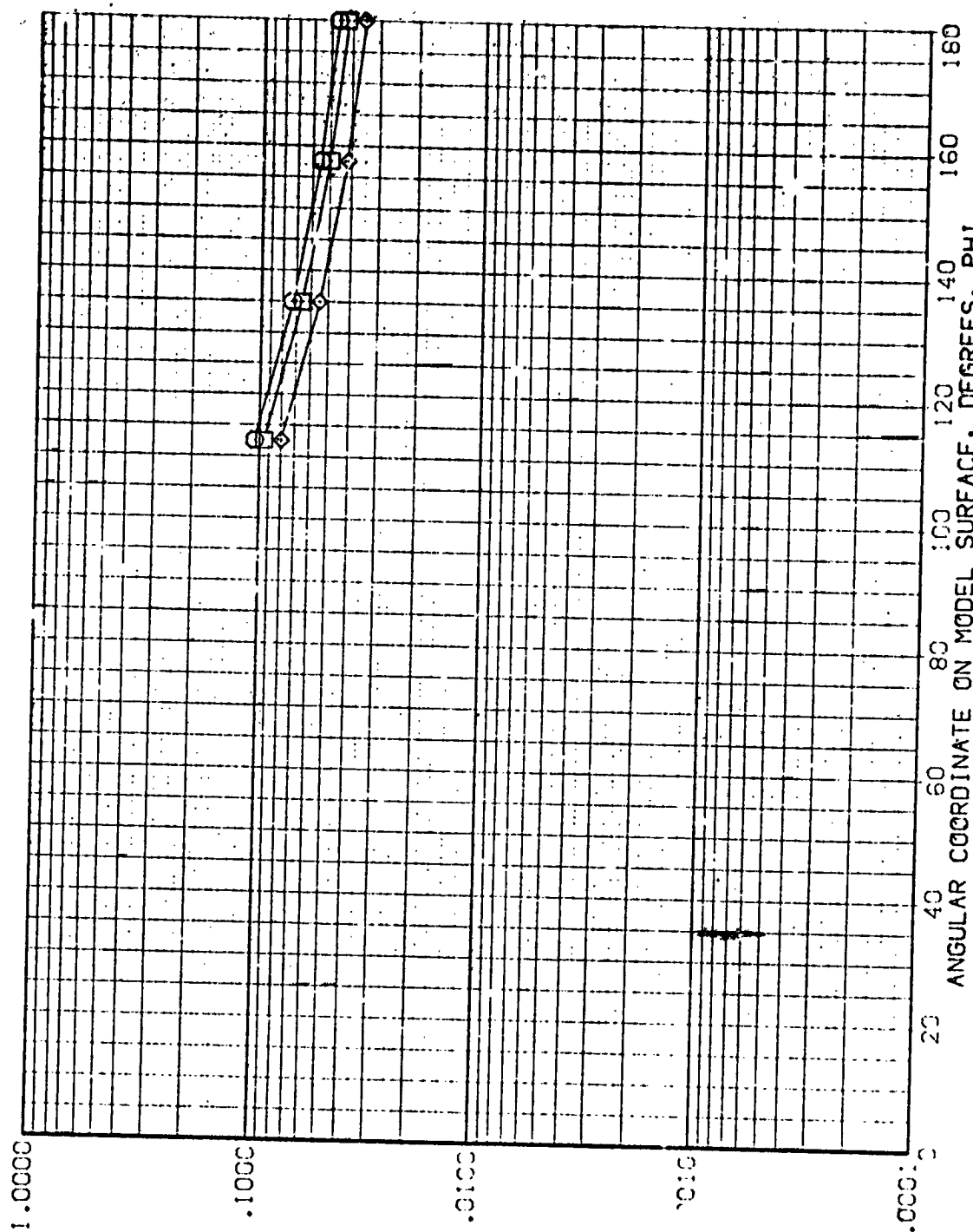


FIG. 5  
TANK, IN THE PRESENCE OF ORBITER

SYMBOL	HAZ/REF	X/L	M/CH	PARAMETRIC VALUES
◇	950	.600	5.219	ALPHA: -90.000
◇	950			BETA 1.000
◇	1.000			RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

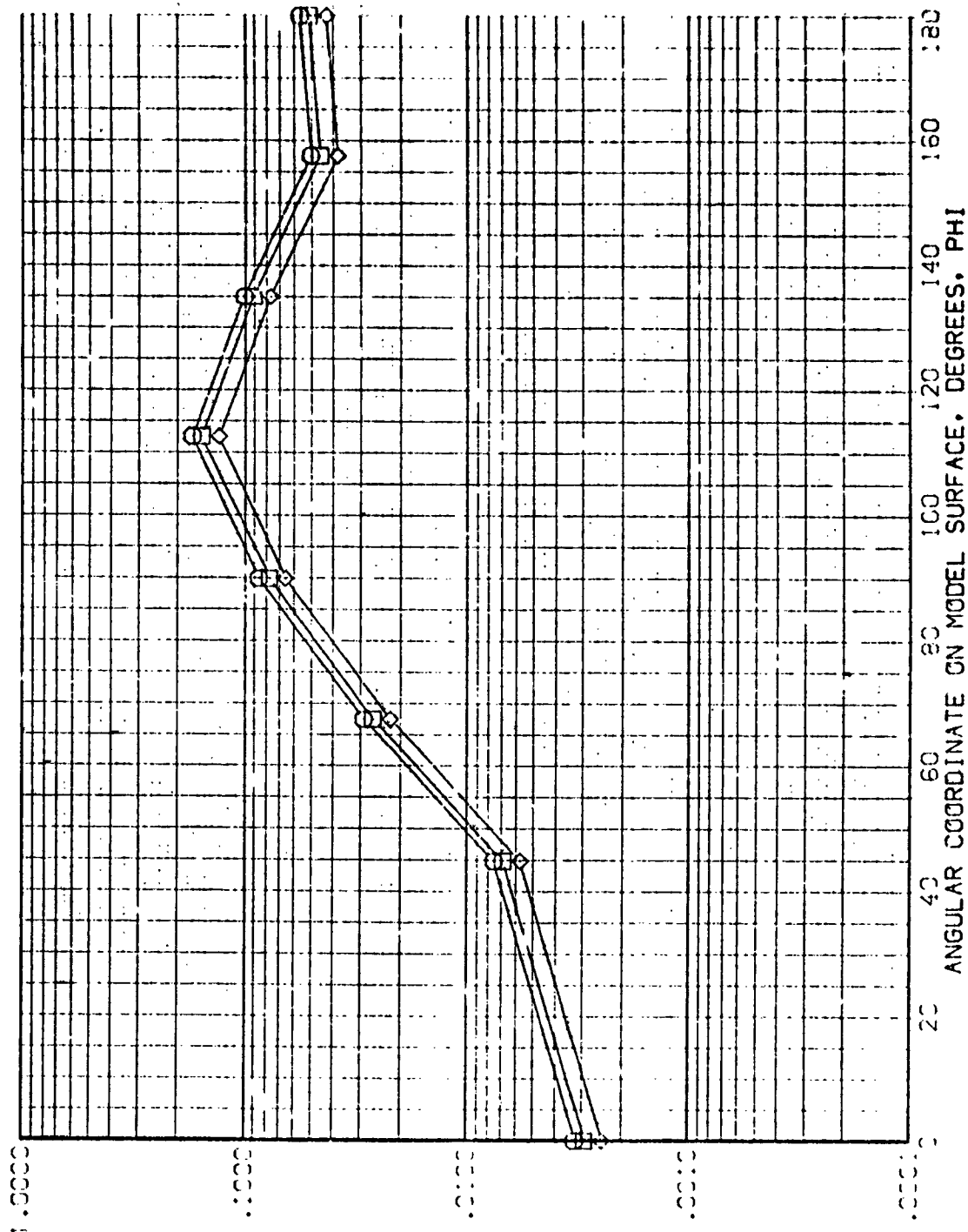


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV107)

SWEEP HAW/H<sup>2</sup> X/L MACH  
 .850 .550 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -5.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

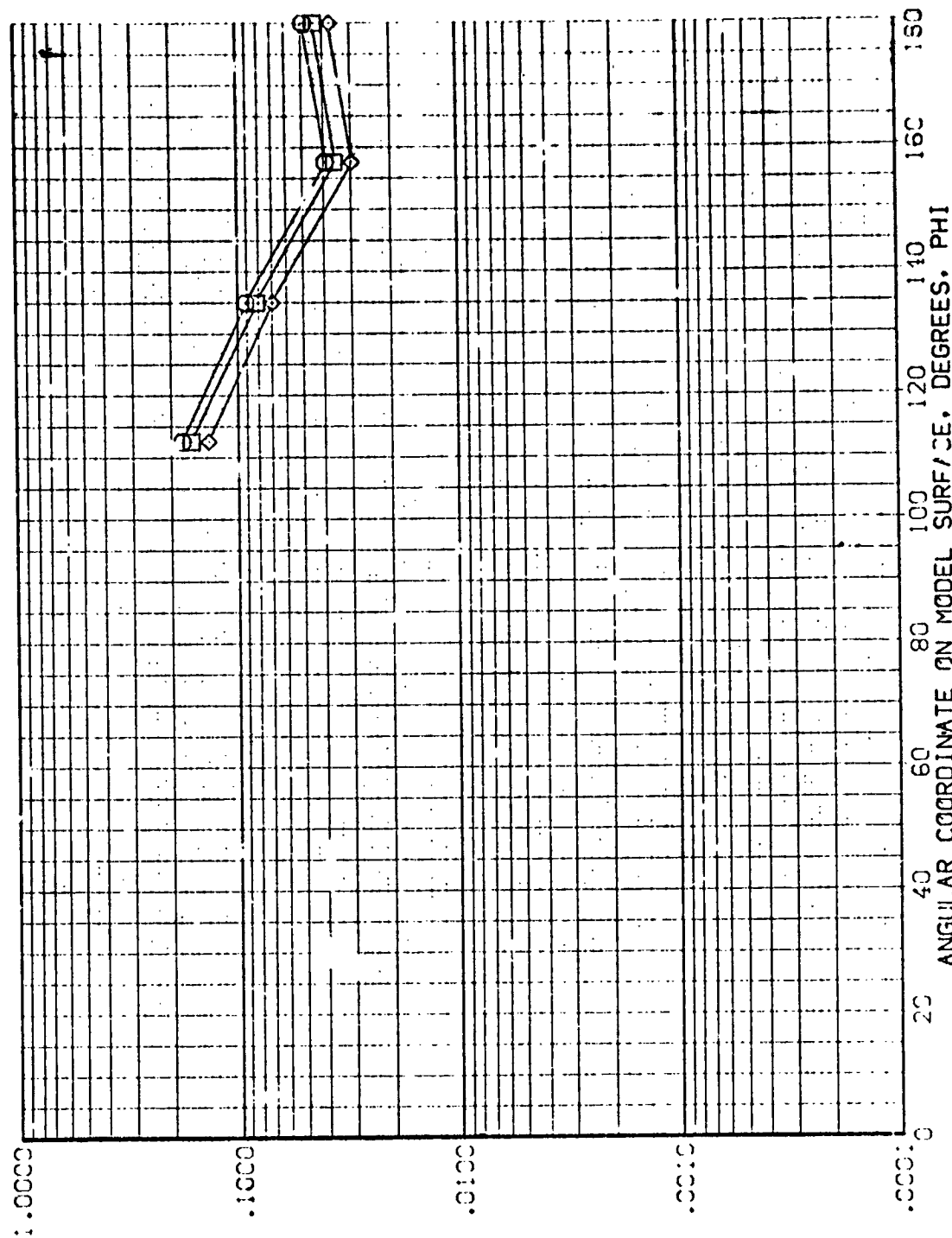


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AVES 3.5-195 1H28 01+11 EXTERNAL TANK

(REV107)

SWED. H/W  $\gamma/L$  MACH  
 .850 .700 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 PR/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

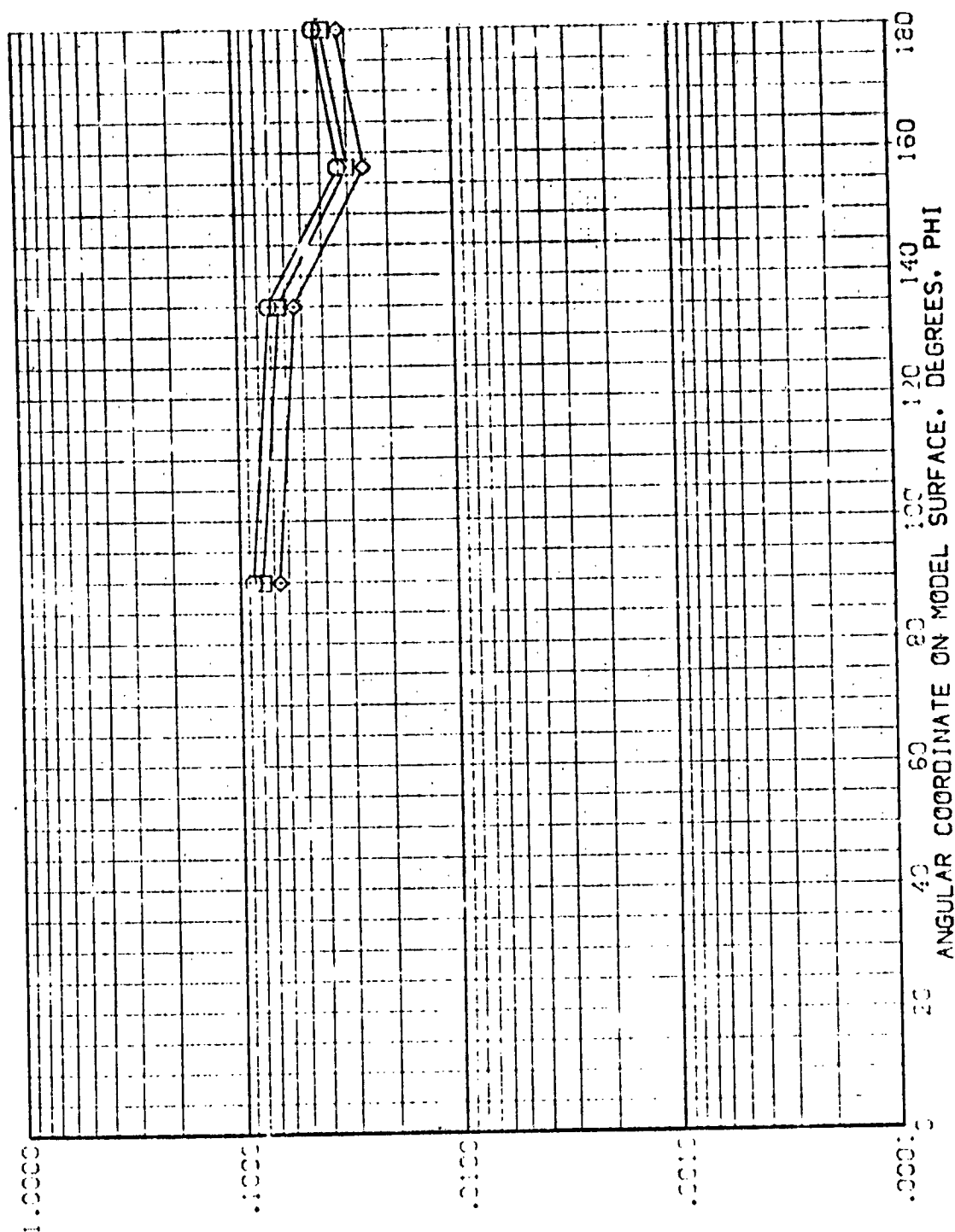


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01+71 EXTERNAL TANK

(REV 1070)

PARAMETRIC VALUES  
ALPHA -50.000 BETA .000  
RV/L 1.000

PARAMETER VALUE  
MACH 5.219  
X/L 1.50  
Y/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

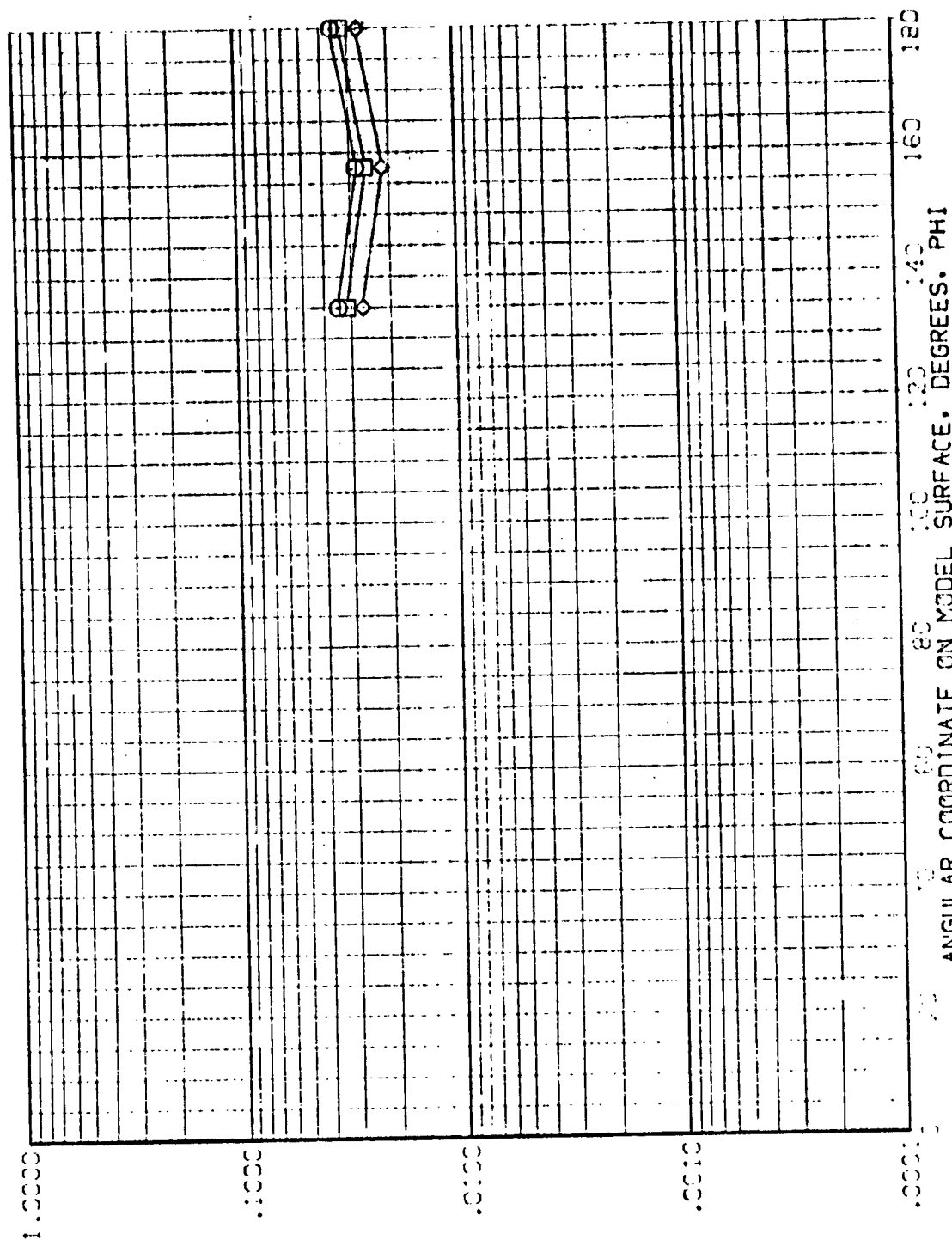


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  
 ◇  
 □  
 ○  
 △

HA/H<sub>∞</sub> K/L MACH  
 .850 .800 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 PA/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

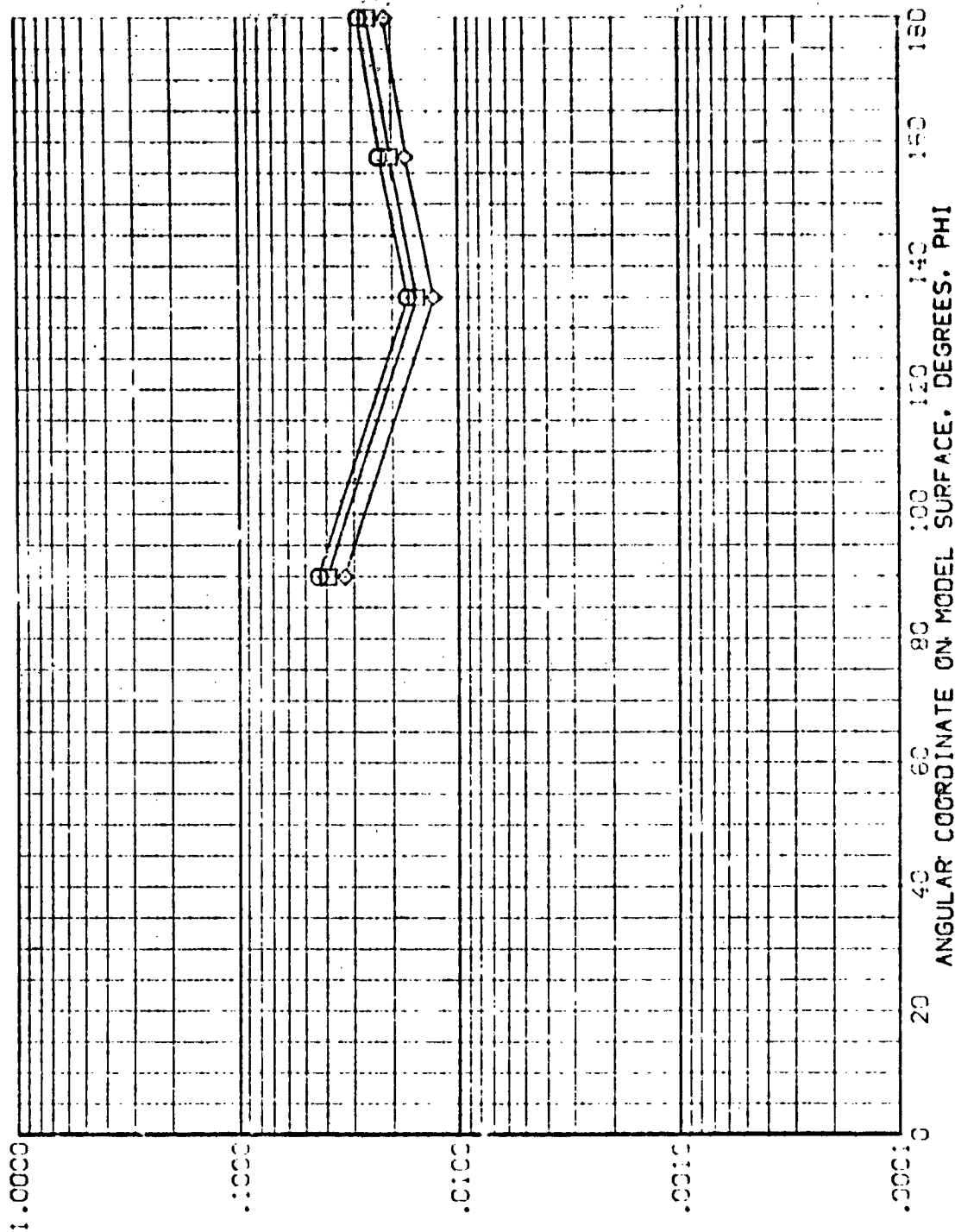


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1-28 01-71 EXTERNAL TANK

(REVISED)

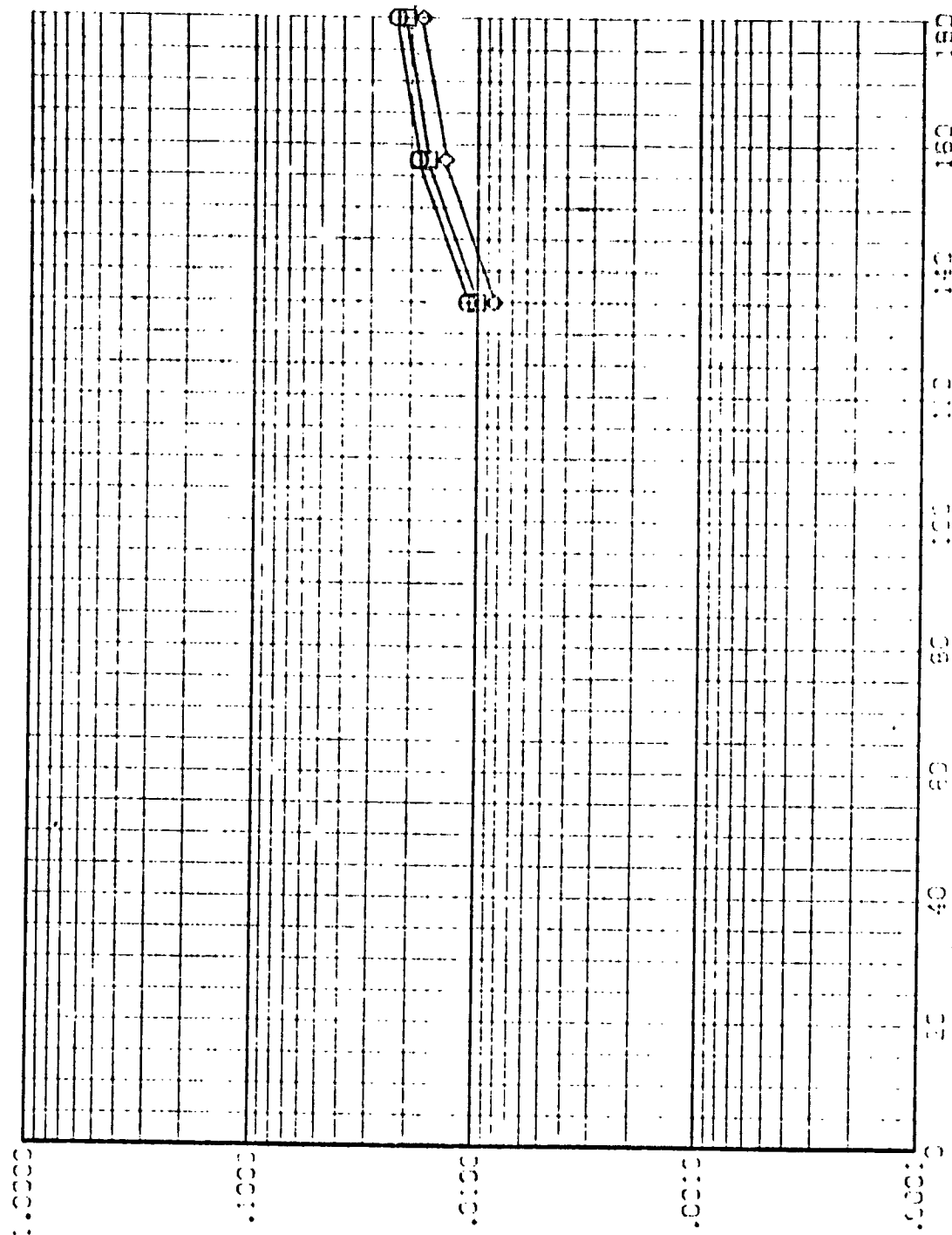
SLIP-  
0.000  
0.000  
0.000  
0.000

WAVE-  
0.000  
0.000  
0.000  
0.000

PARAMETER VALUES

ALPHA 0.000  
BETA 0.000  
GAMMA 0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF



ANGULAR COORDINATE ON MODEL SURFACE, DEGREES, PHI

FIG. 5 TANK IN THE PRESENCE OF CPBITER

1  
 2  
 3  
 4  
 5  
 6  
 7  
 8  
 9

[illegible]

AD-4	89-067-1-135	
AD-1	-3000	100
AD-2	1000	100

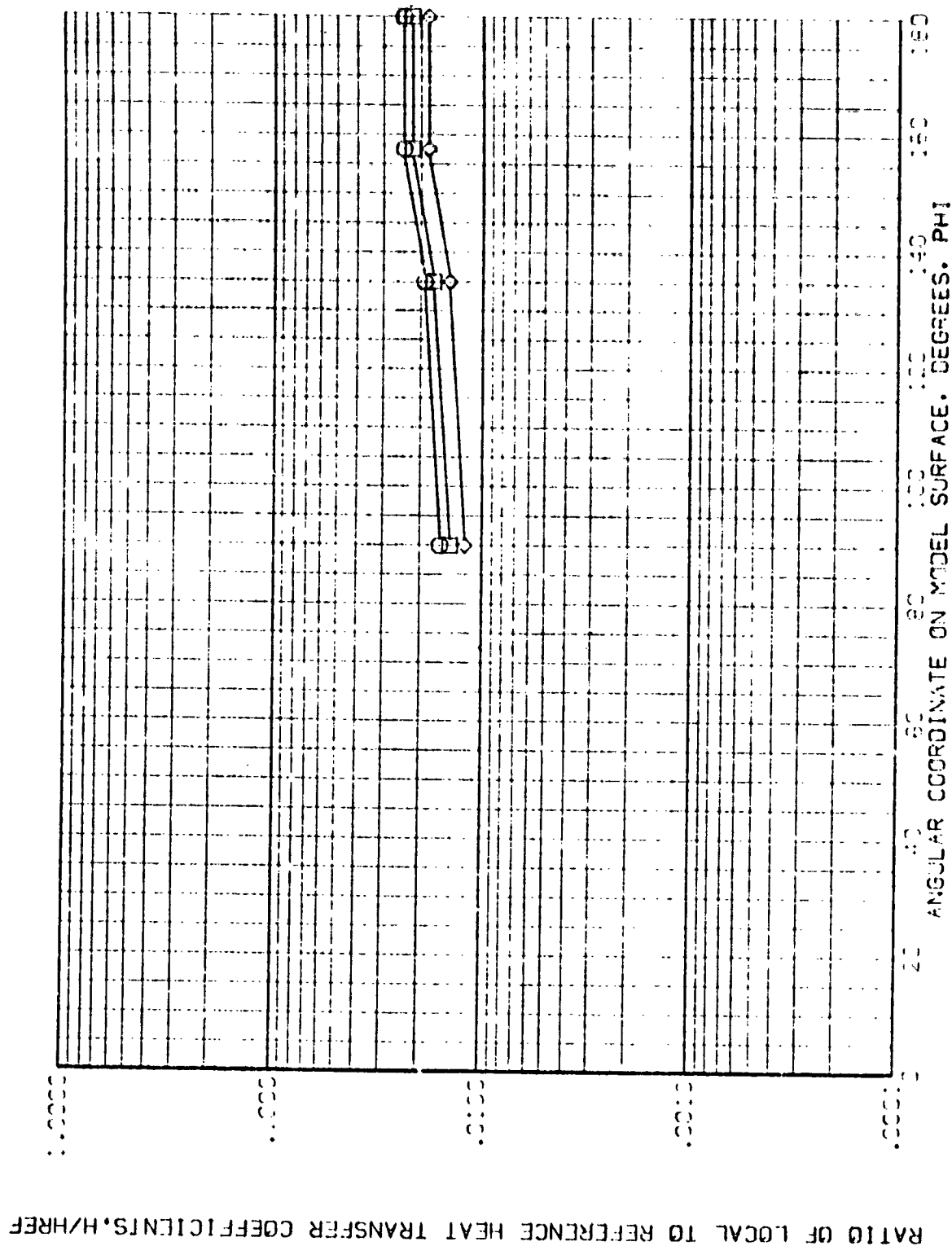


FIG. 5 TANK, IN THE PRESENCE OF ORBITER.

1 1 1  
 1 1 1  
 - 1  
 1 1

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SYNOPSIS  
 L/H/H\*  
 .850  
 .900  
 1.000

X/L  
 .400  
 MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 0.000  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

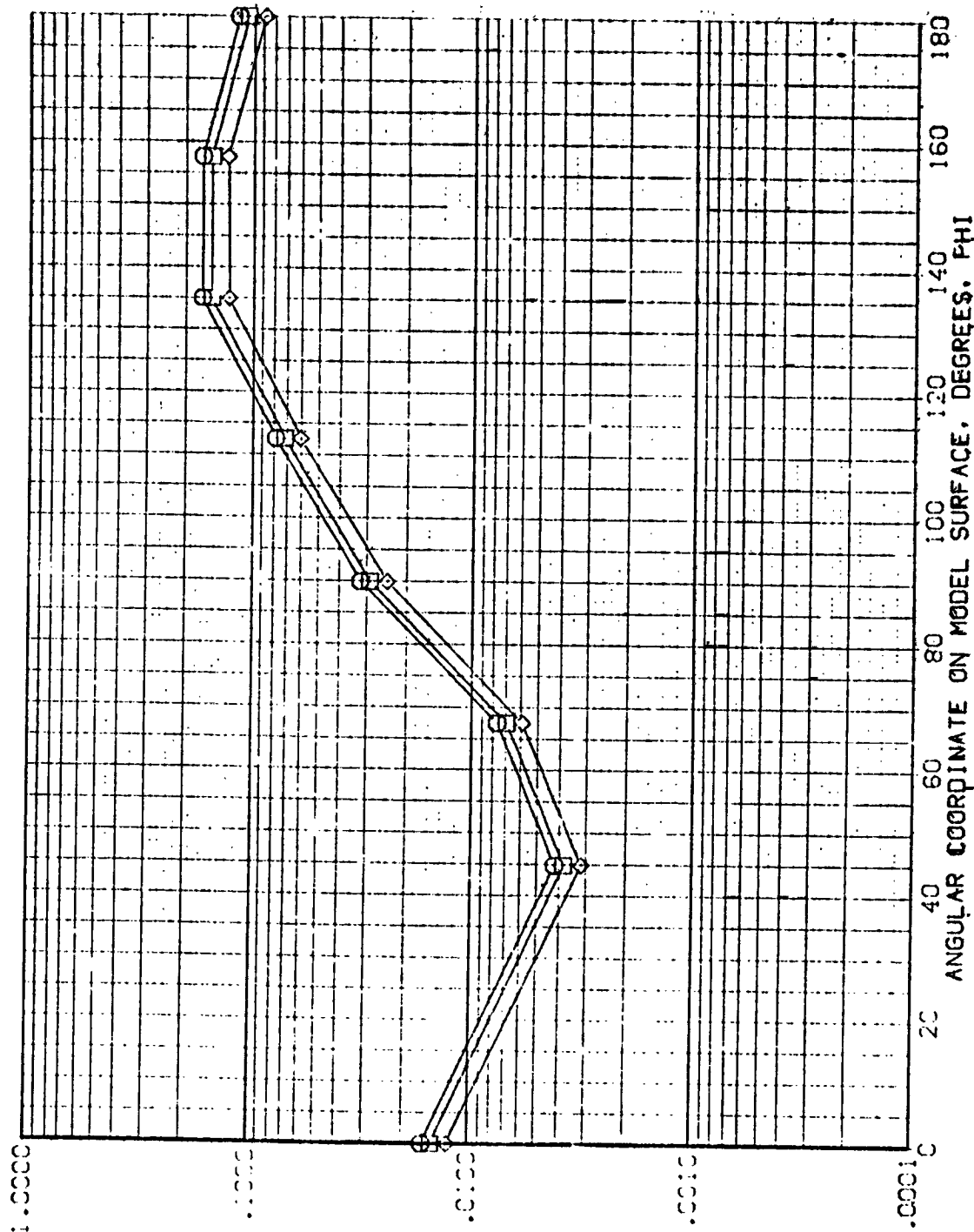


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AXES 3.5-195 IH28 01+11 EXTERNAL TANK

(REV108)

SAVED H<sub>REF</sub> X/L MACH  
 .850 .450 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -80.000  
 BETA 1.000  
 PIV/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

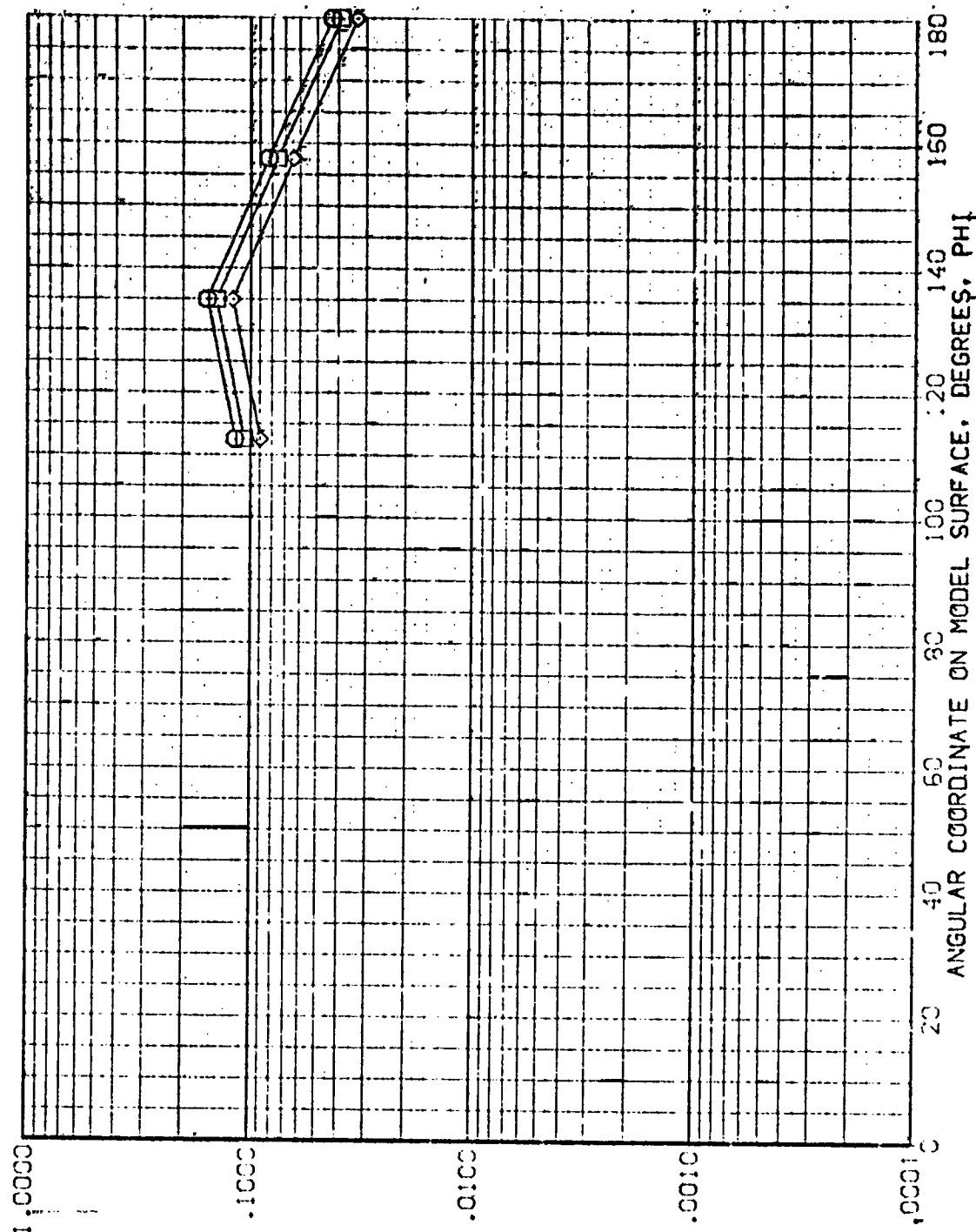


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SYMBOL  
 ◇ □ ○  
 H/W/H/T  
 .850  
 .900  
 1.000

X/L  
 .500

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RAYL  
 -60.000  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

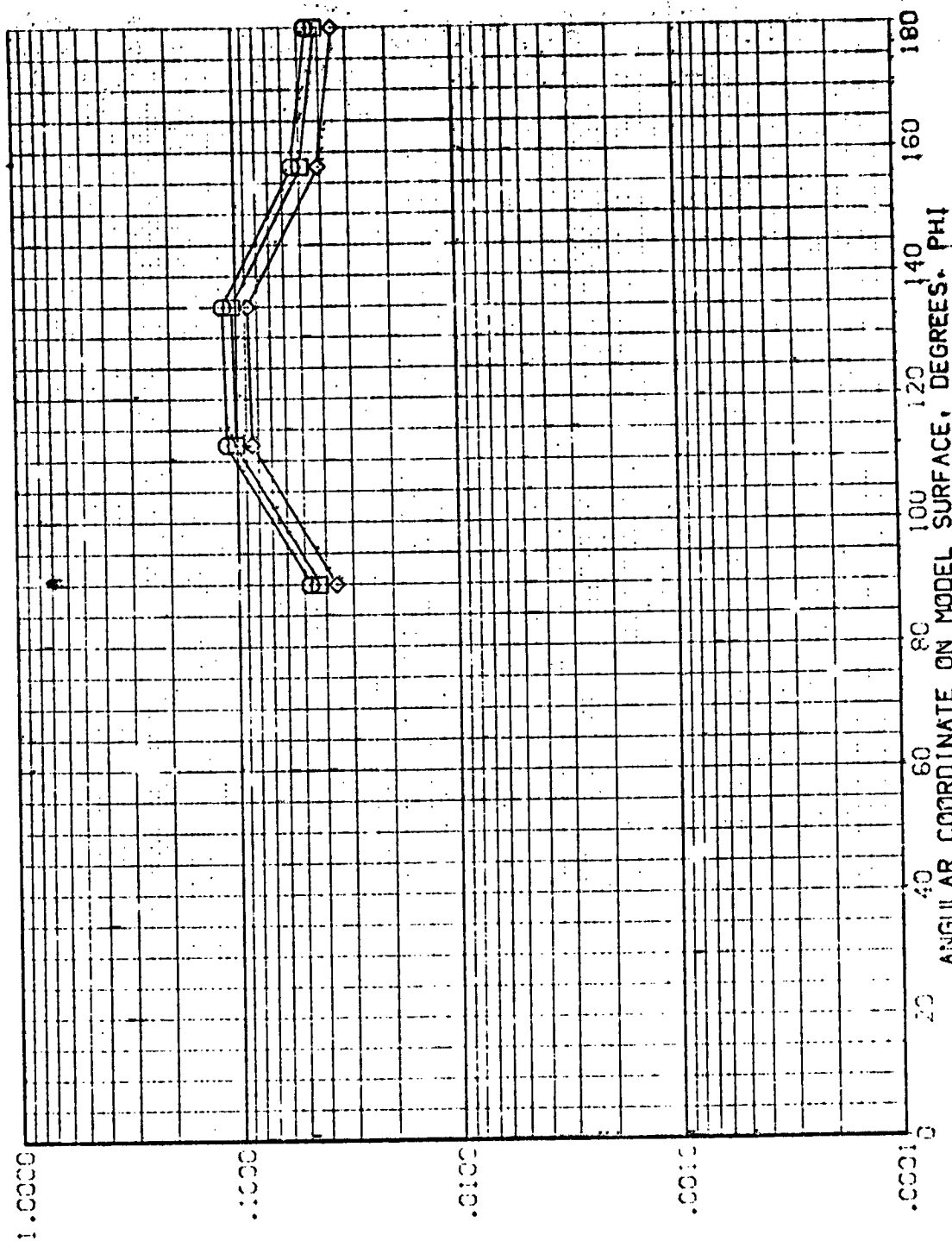


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REPRODUCIBILITY OF THE  
 ORIGINAL PAGE IS POOR

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SWEC. HEIGHT  
 .850  
 .900  
 1.000

WICH  
 .550  
 5.220

PARAMETRIC VALUES  
 ALPHA -60.000  
 RNAL 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

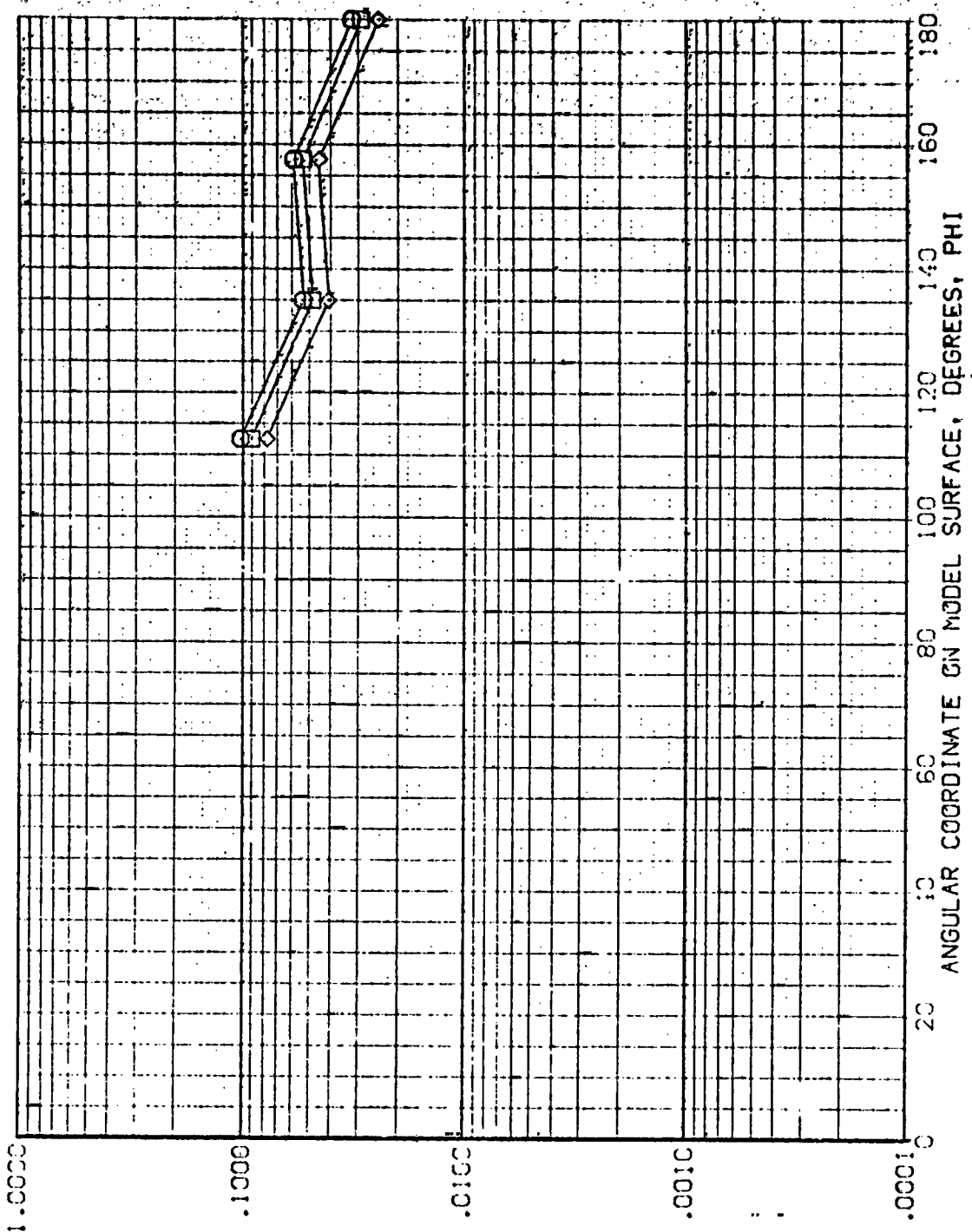


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SWEEP - HEIGHT X/L MACH  
 .950 .500 5.220  
 .950  
 1.000

PARAMETER VALUES  
 ALPHA -EQ.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

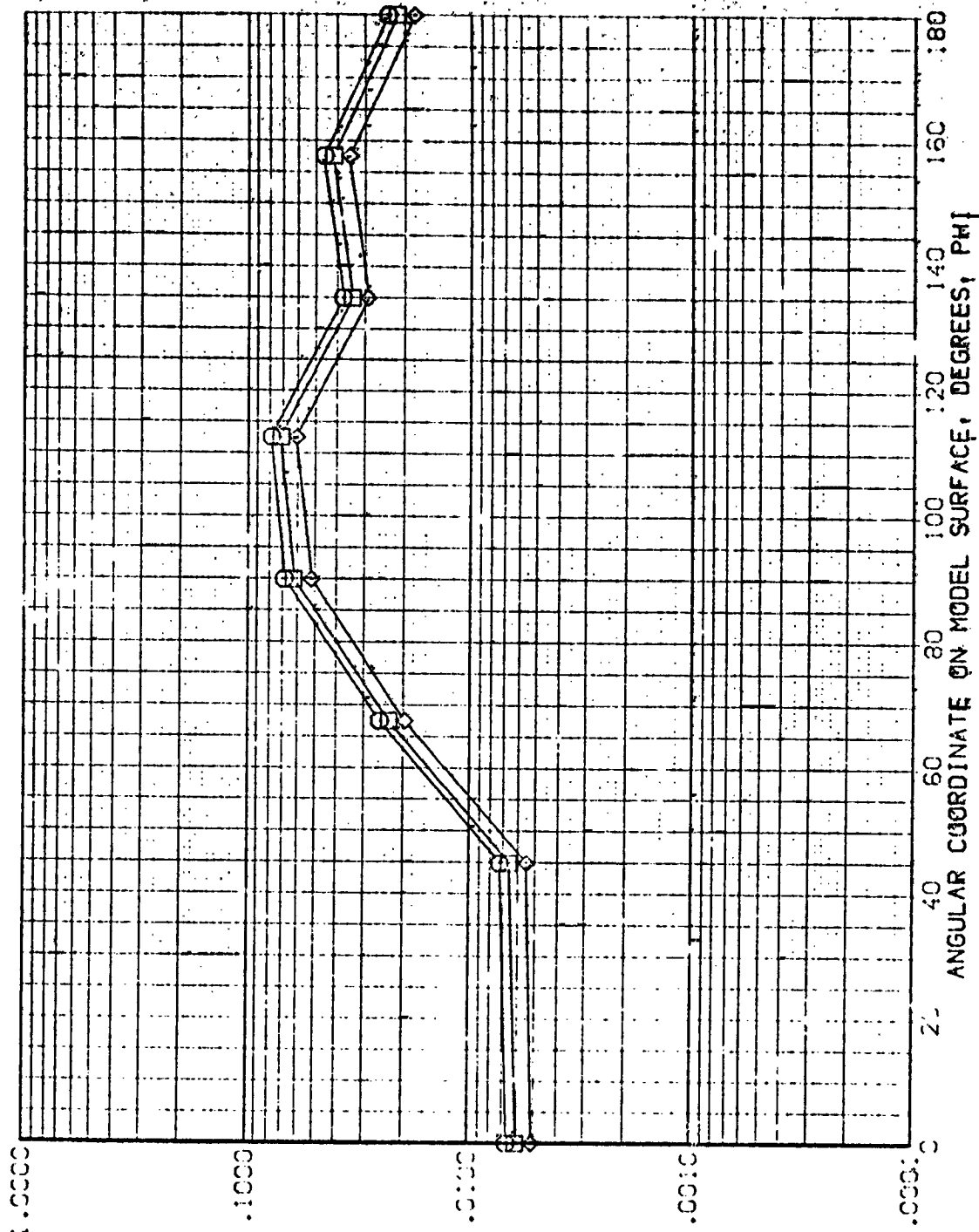


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3,5-195 IH28 01+T1 EXTERNAL TANK

(REV T08)

SYNOPSIS  
 WING/REF .850  
 X/L .650  
 MACH 5.220  
 REYNOLDS 1.000

PARAMETRIC VALUES  
 ALPHA -60.000  
 PN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

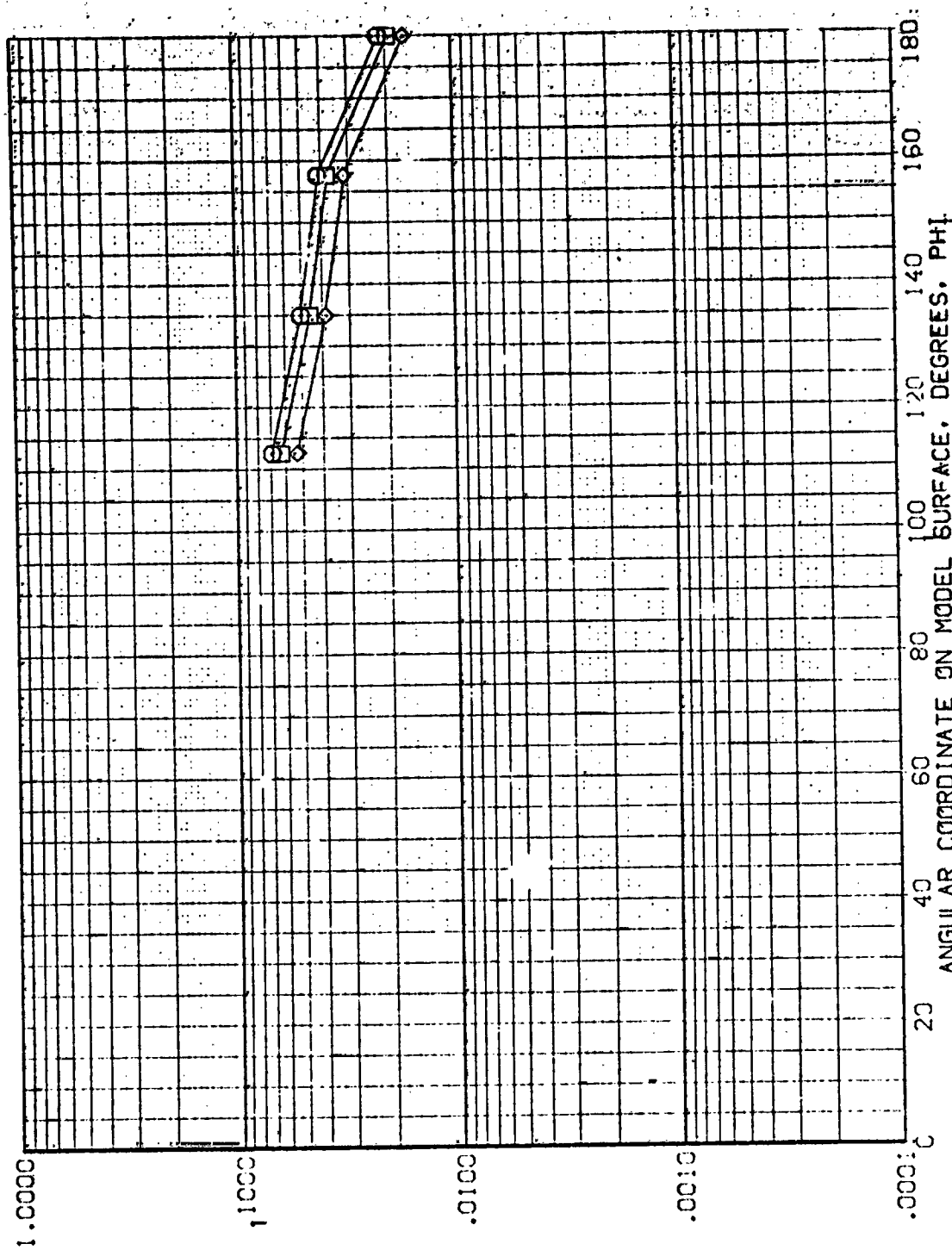


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  
 □  
 ◇  
 1.000  
 .900  
 .800  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 .000

CL  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 .000

PARAMETRIC VALUES  
 ALPHA  
 -60.000  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

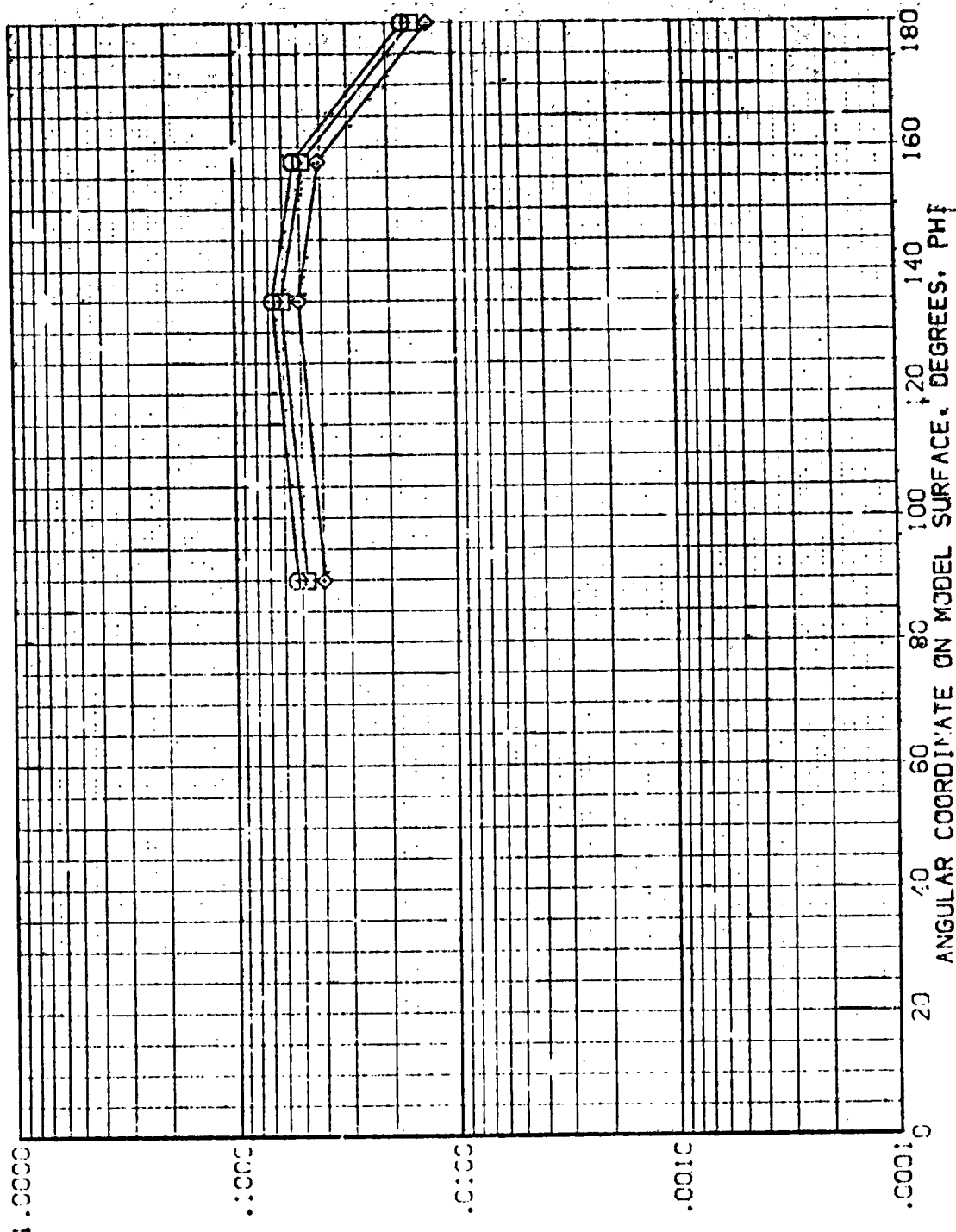


FIG. 5 TANK IN THE PRESENCE OF ORBITER

(REV 108)

PARAMETRIC VALUES  
-60.000 BETA  
1.000

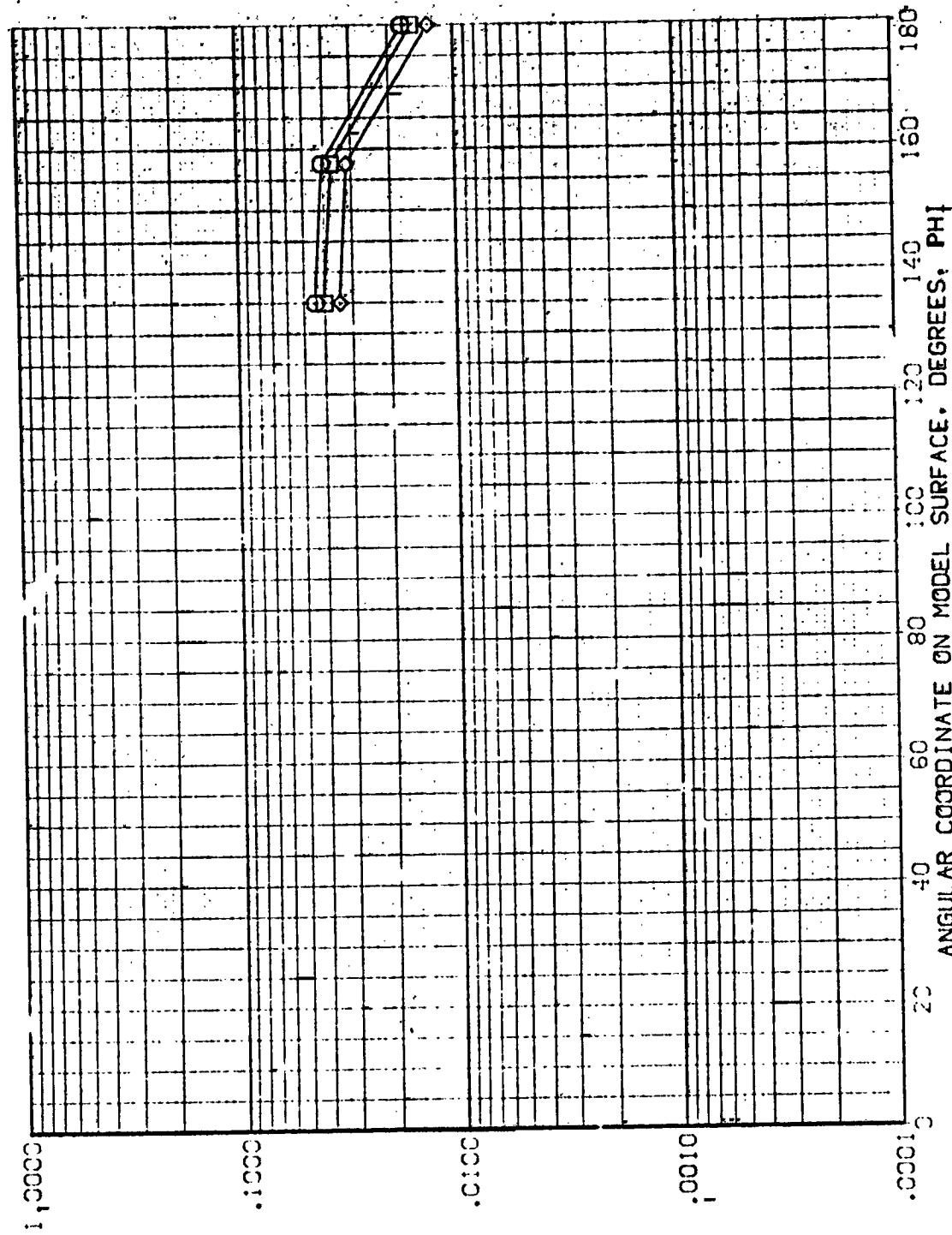


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  $\square$   $\diamond$

WALL/HT .850  
X/L .900  
MACH 5.223

PARAMETRIC VALUES  
ALPHA -60 DEG  
RWL 1.000  
SE-A .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

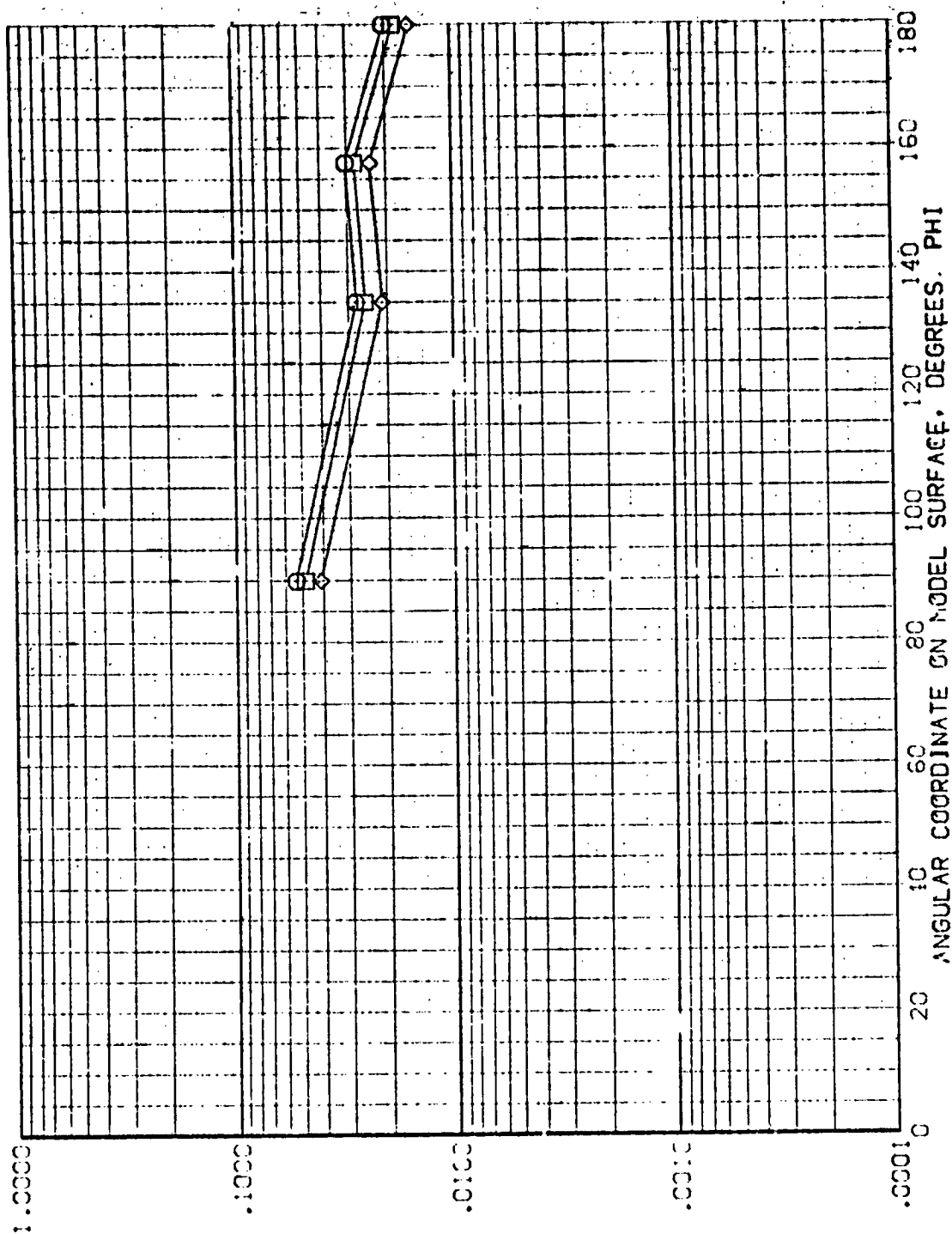


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AXES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV108)

PARAMETRIC VALUES  
 ALPHA -60.080 BETA 1.000  
 PNI/L  
 X/L .850  
 Y/L .850  
 Z/L .850  
 W/L .850  
 VACH 5.220

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

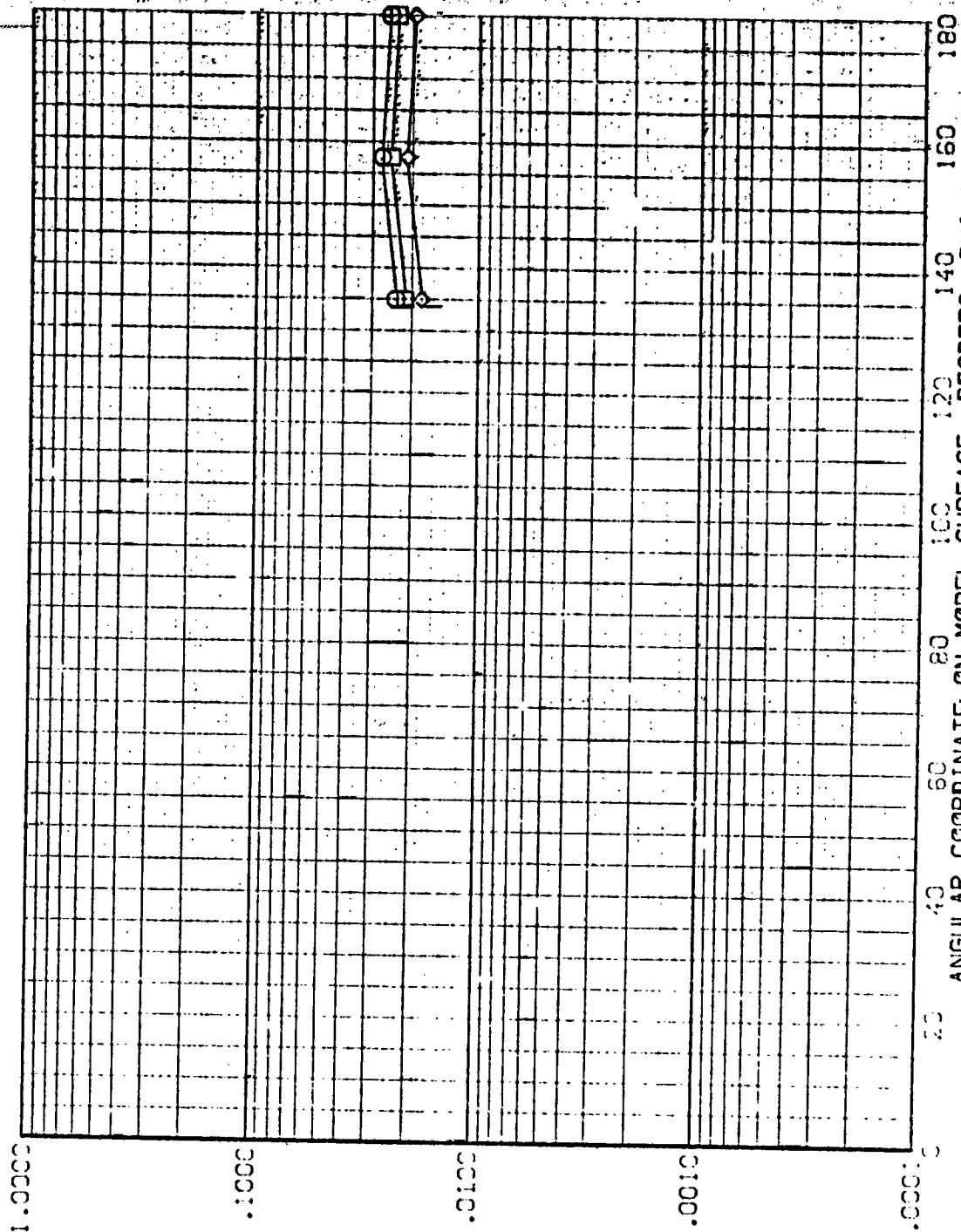


FIG. 5 TANK IN THE PRESENCE OF ORBITER



# AMES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV108)

SYNCH HAWAII X/L W/LCH  
 .850 .900 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 R/W/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

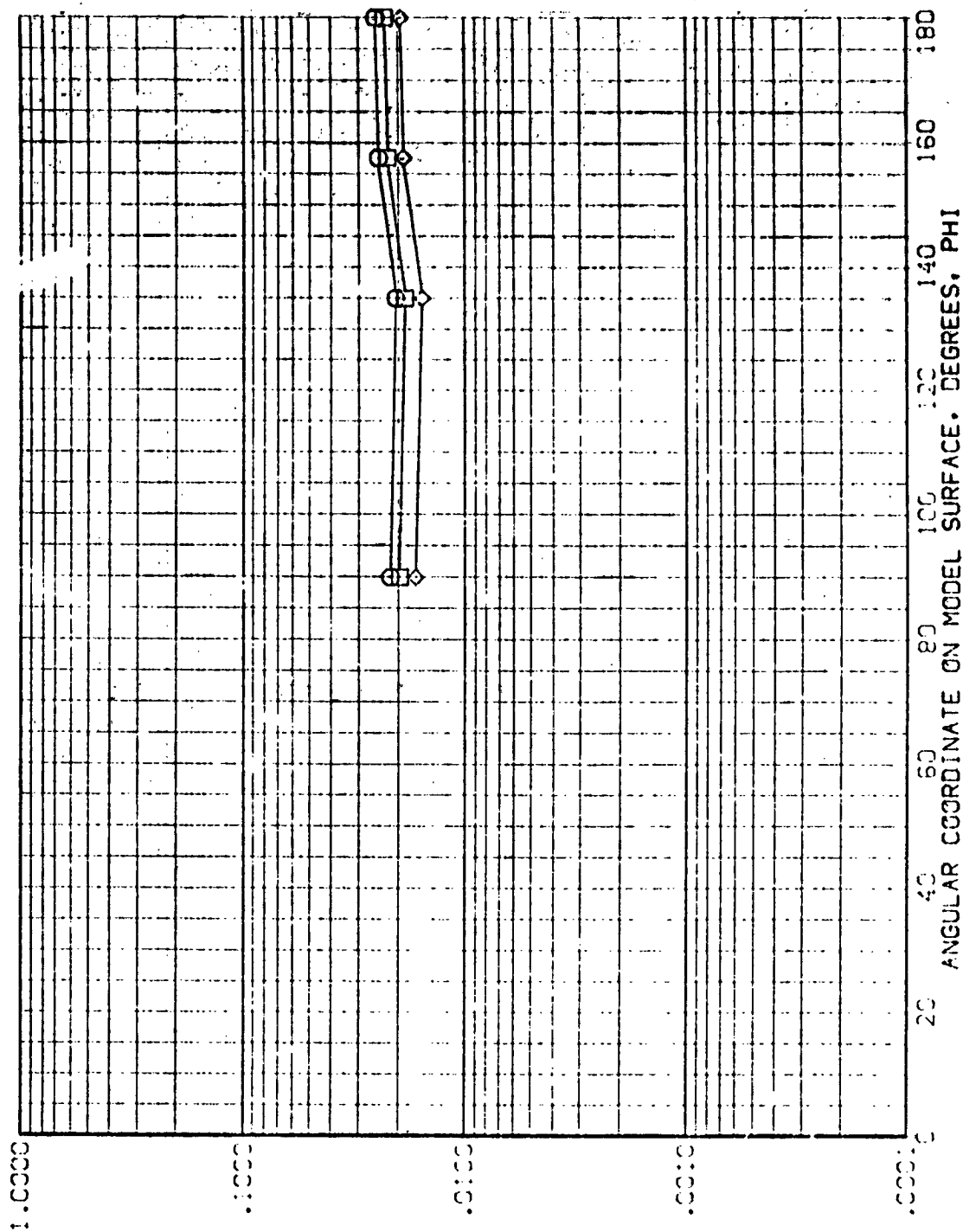


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REPRODUCIBILITY OF  
 ORIGINAL PAGE IS POOR

AMES 2.5-125 1428 01+T1 EXTERNAL TANK

(REV 09)

PARAMETRIC VALUES  
 ALPHA -30.000  
 BETA 1.000  
 RATIO 1.000  
 VELOCITY 5.219

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

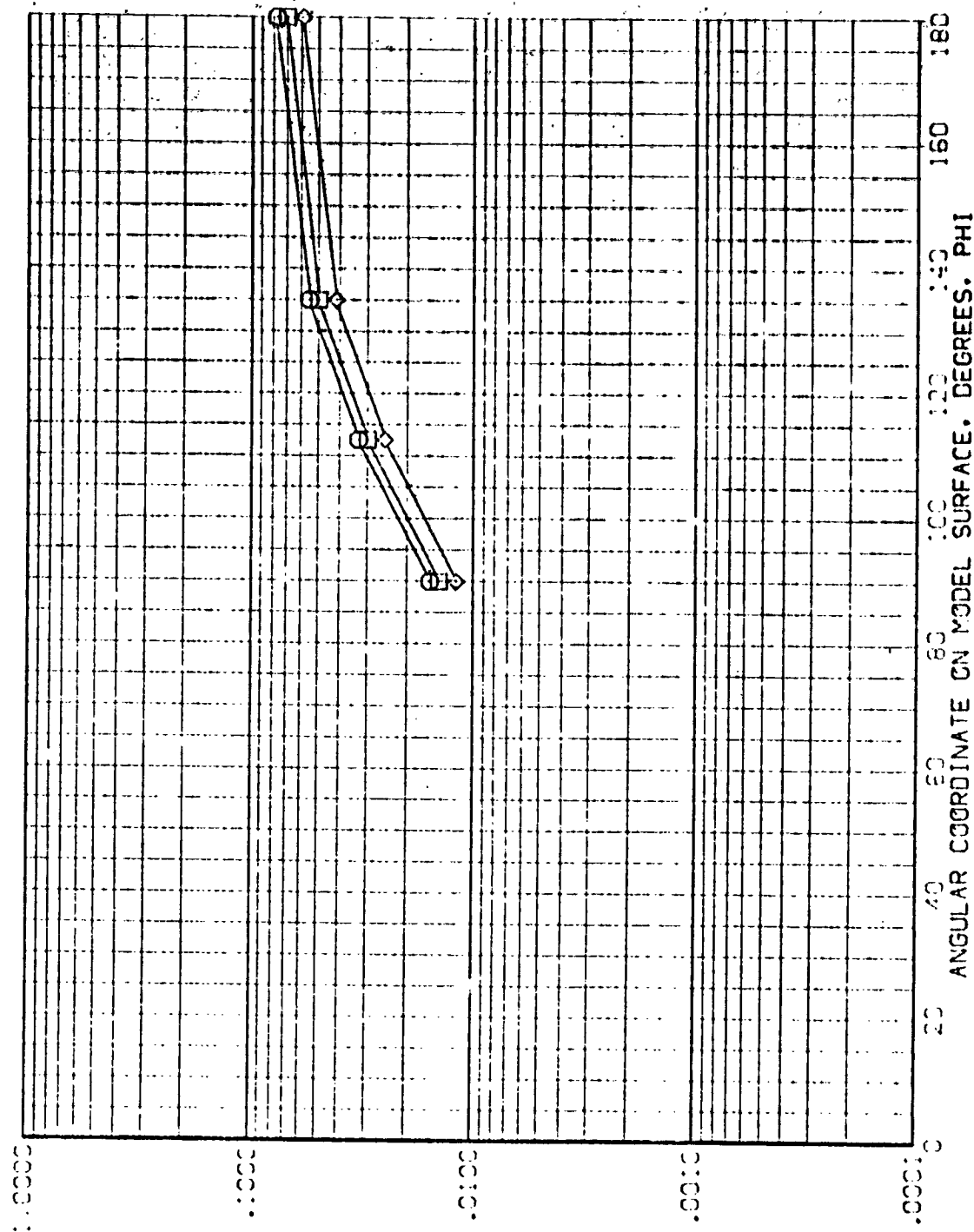


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

ST. SEC. HAW/M<sup>2</sup> M/L MACH

.850 .400 5.219  
.900  
1.000

PARAMETRIC VALUES  
ALPHA -30.000 BETA .200  
PN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

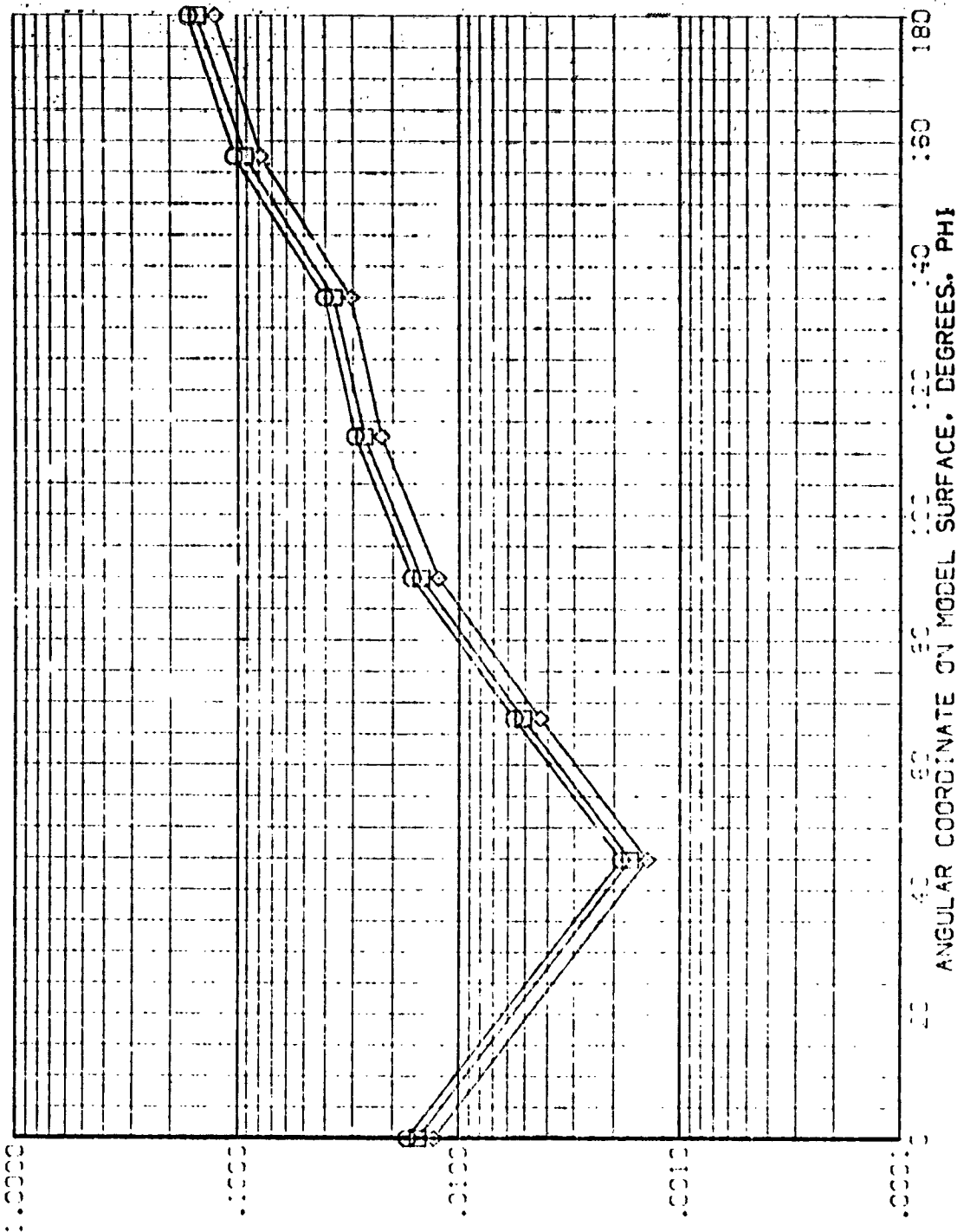


FIG. 5 TANK IN THE PRESENCE OF ORBITER

FIG. 5 TANK, IN THE PRESENCE OF ORBITER

PARAMETRIC VALUES  
 ALPHA  
 -30.000  
 BETA  
 1.000

(REF. 100)

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

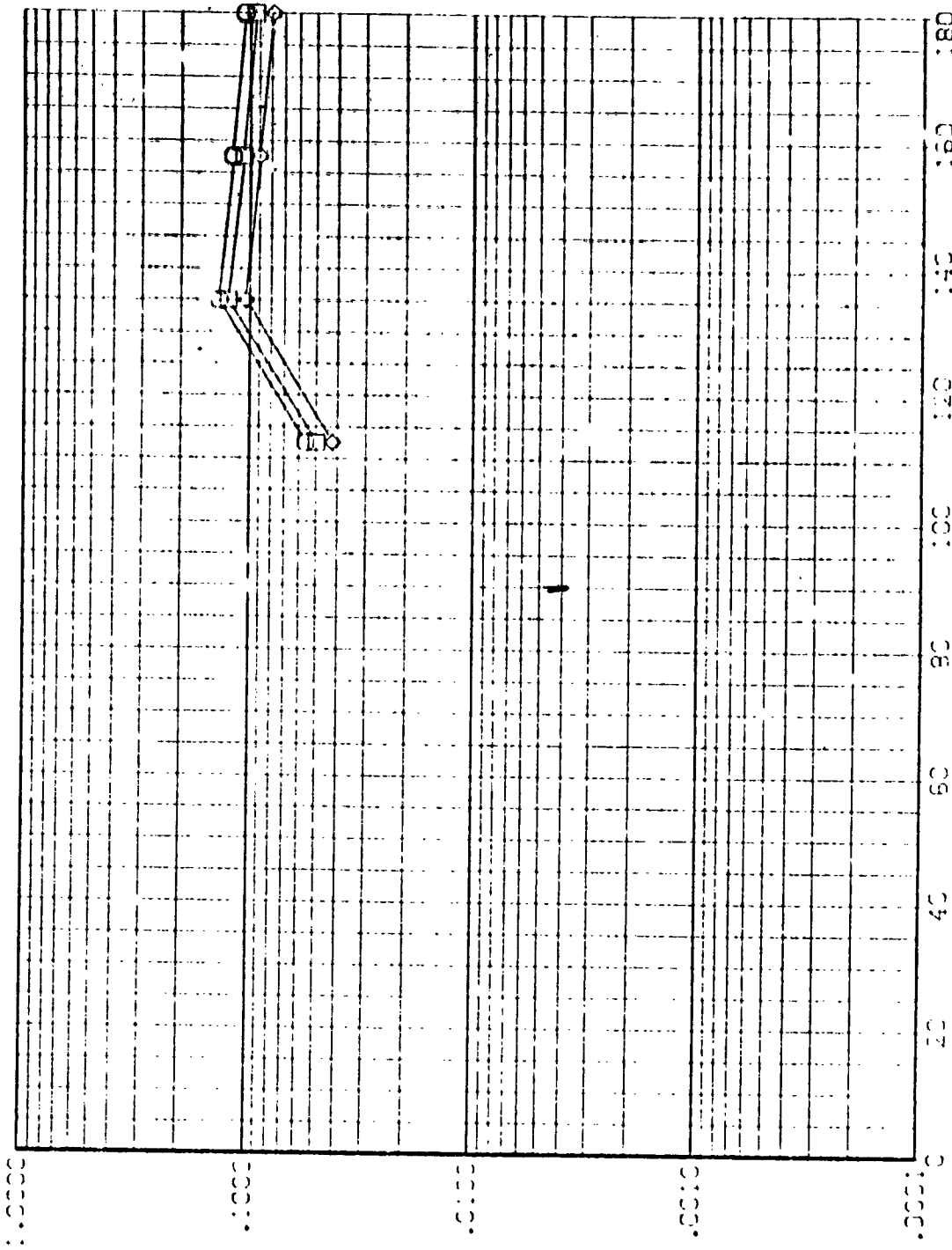


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYNOPSIS

WAVE/WT .850  
X/L .500  
MACH 5.219  
REF 1.000

PARAMETRIC VALUES  
ALPHA -30.000  
PR/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

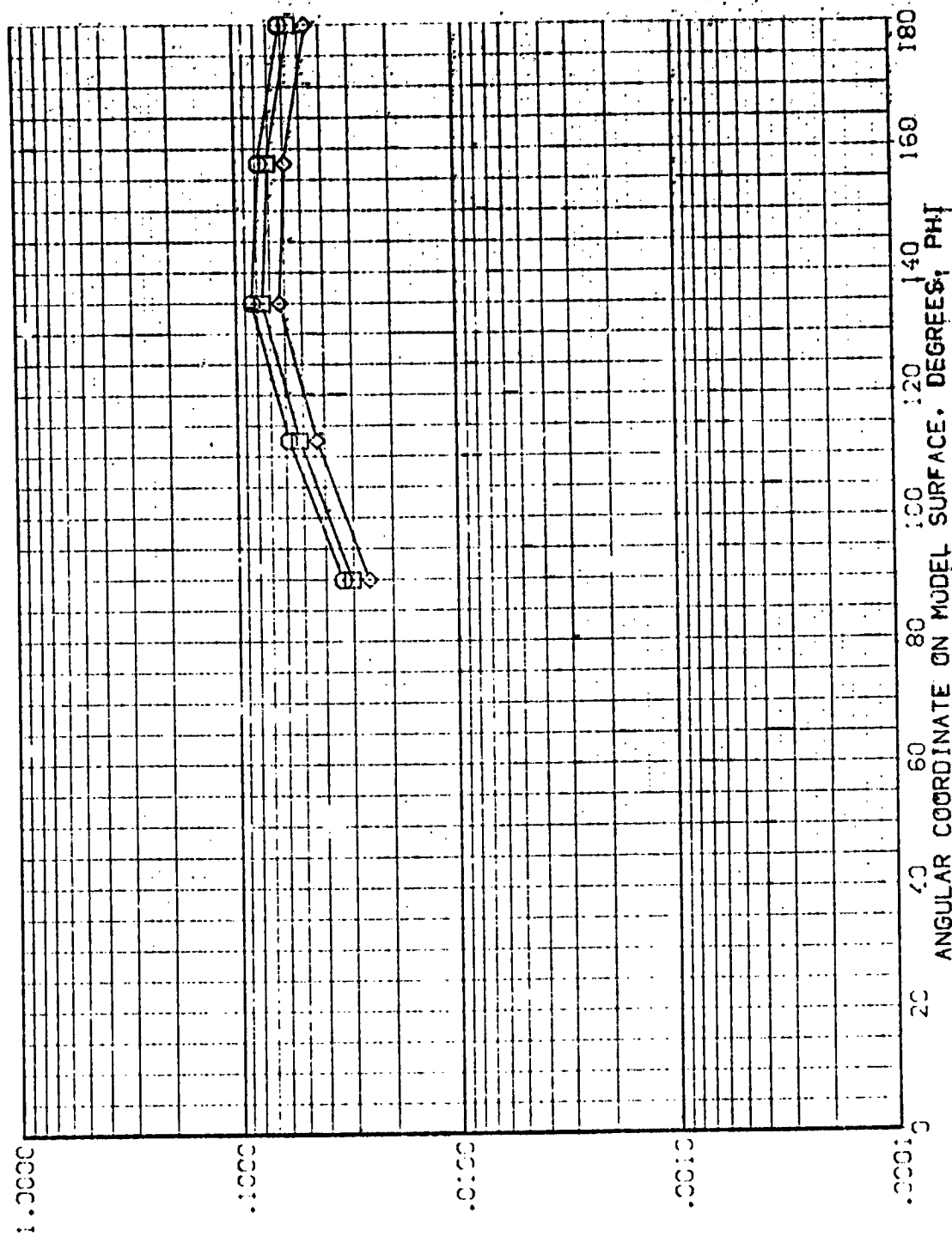


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

ANES 3.5-125 1428 31-T1 EXTERNAL TANK

(REV T09)

SLUGS  
H<sub>2</sub>O  
.850  
.900  
1.000

V<sub>1</sub>  
.550  
5.219

PARAMETRIC VALUES  
ALPHA  
RN/L  
-30.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

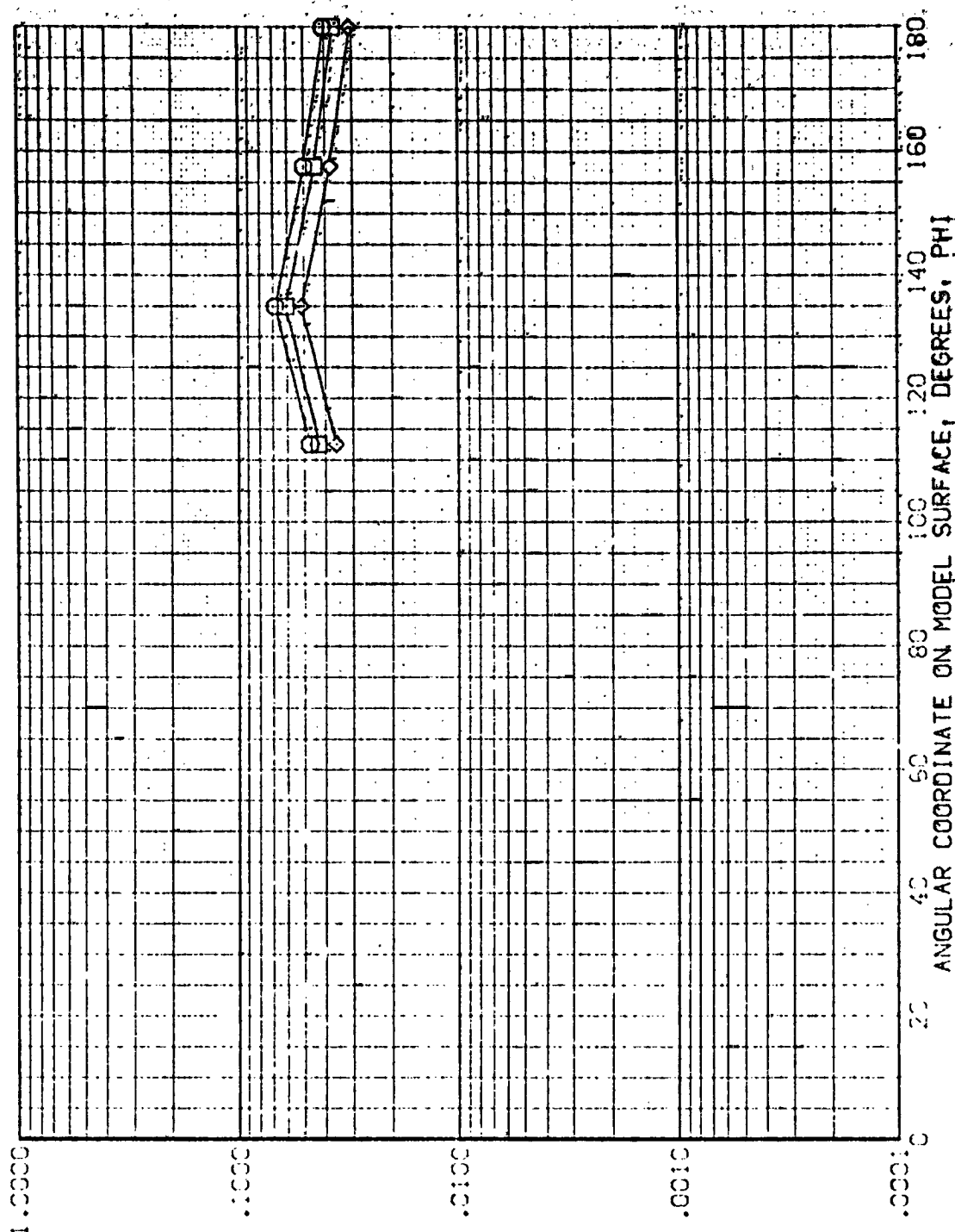


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV109)

SYMBOL H/W/T X/L MACH

◇ 0.853 0.600 5.219  
 □ 0.953 0.600 5.219  
 △ 1.000 0.600 5.219

PARAMETRIC VALUES  
 ALPHA 0.000 BETA 0.000  
 PNU/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

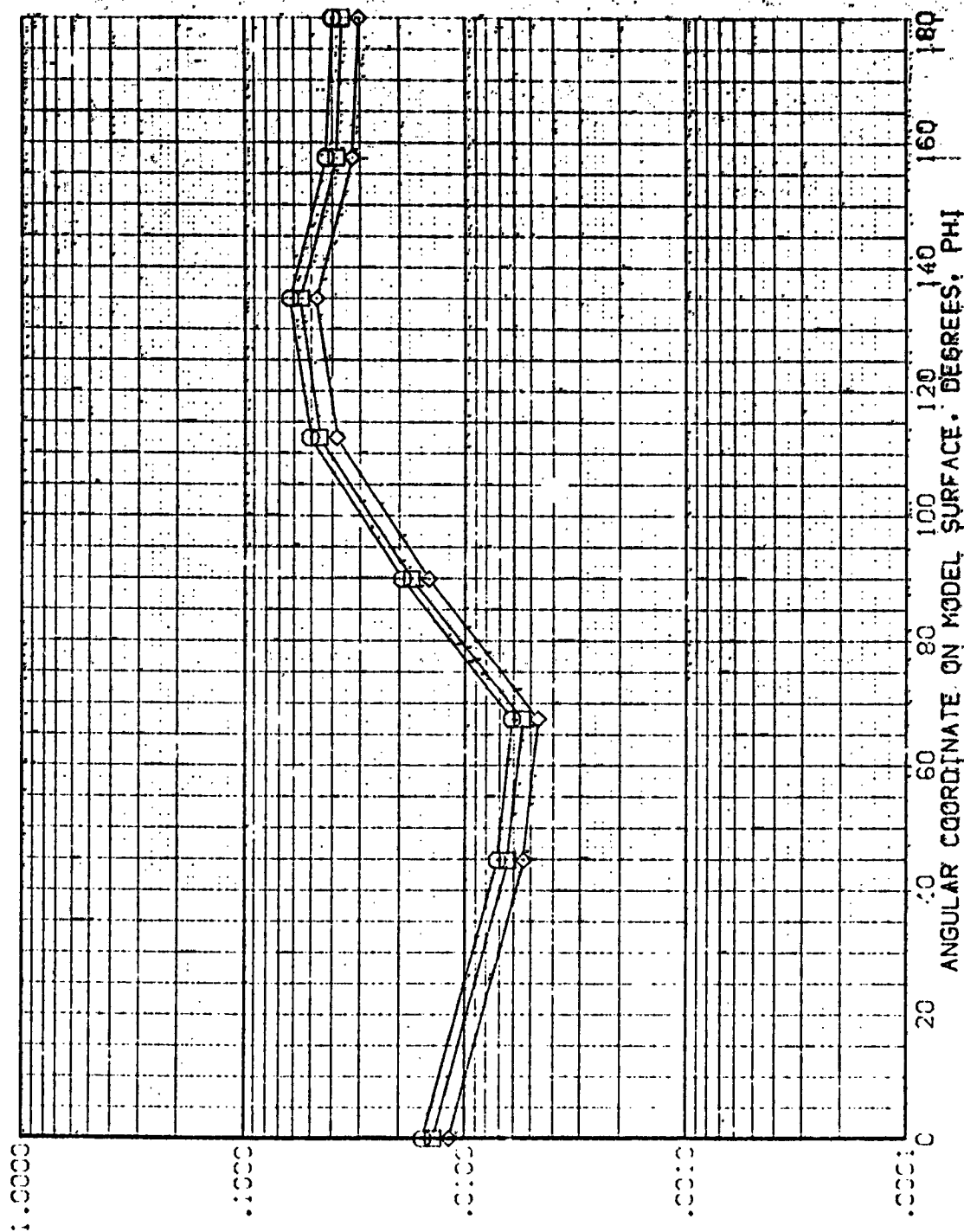


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV109)

SYMBOL  $H_A/H_R$   $X/L$   $MACH$   
 □ .850 .630 5.219  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA -30.000  
 RNVL 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

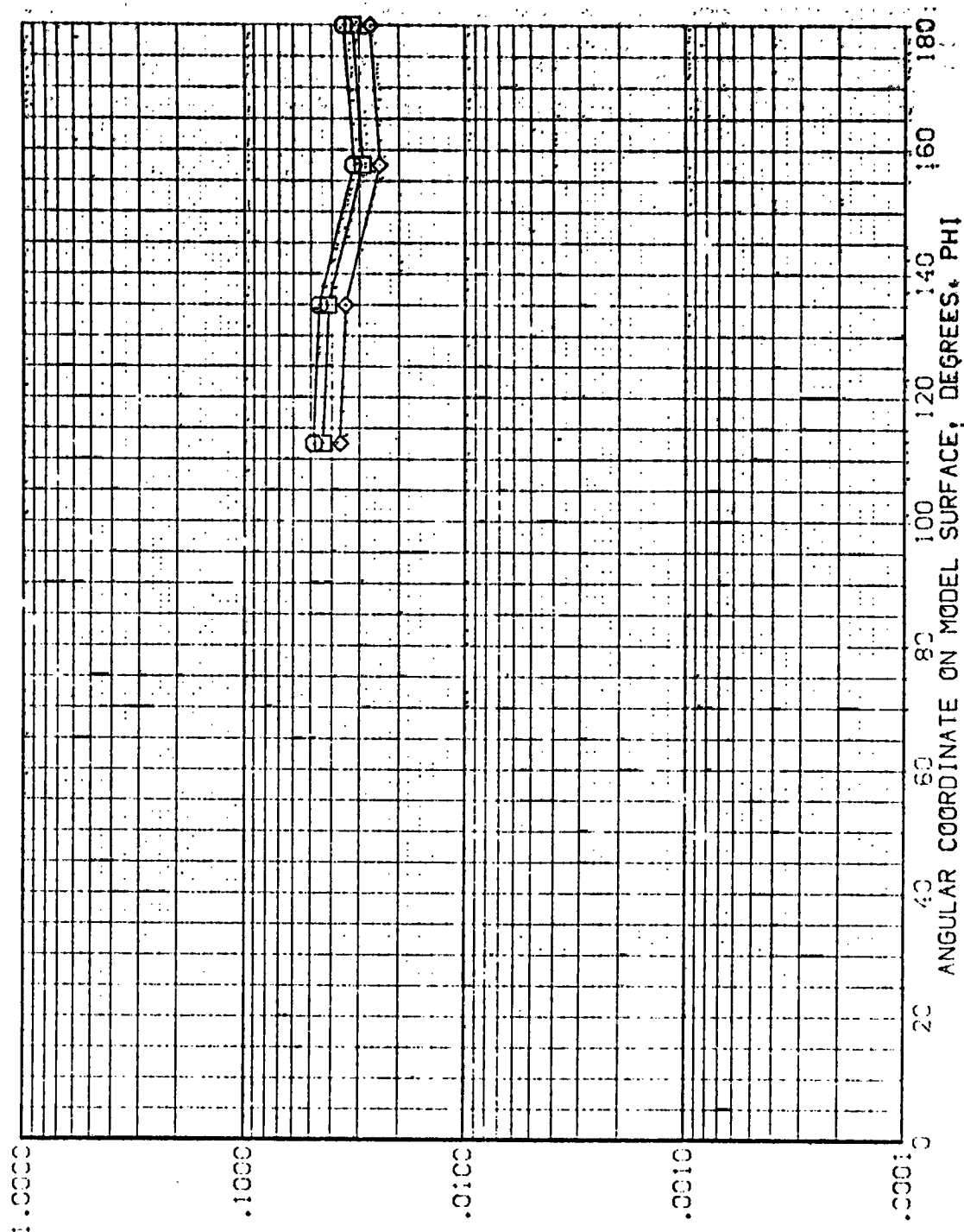


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



AYES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T09)

SYMBOL  
 □  
 ◇  
 HAW/H  
 .850  
 .900  
 1.000

X/L  
 .700  
 MACH  
 5.219

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -30,000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

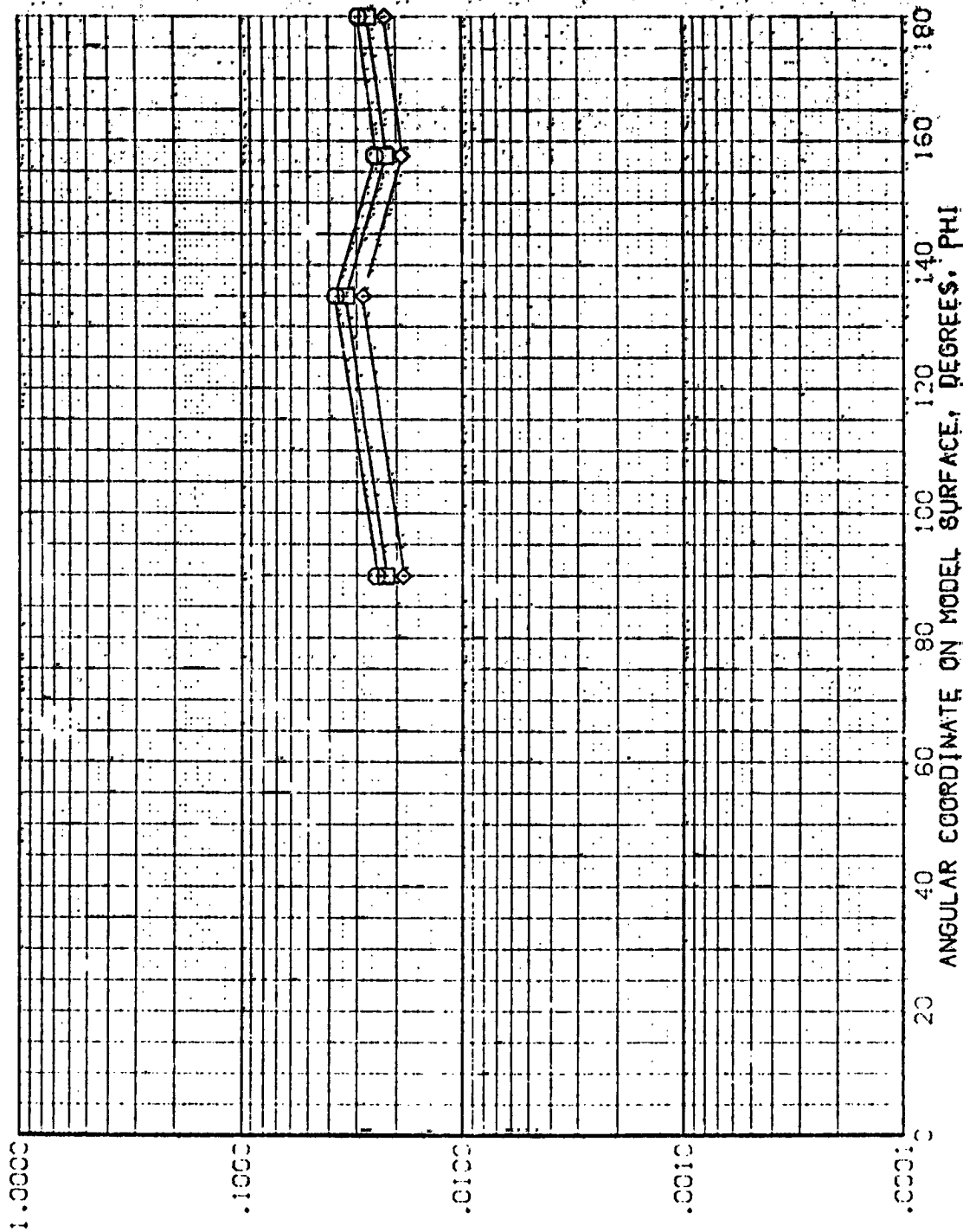


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(RE/TO9)

SVR. H<sub>REF</sub>/H<sub>REF</sub> V<sub>REF</sub> V<sub>REF</sub>  
 .950 .750 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000 BETA .000  
 PM/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

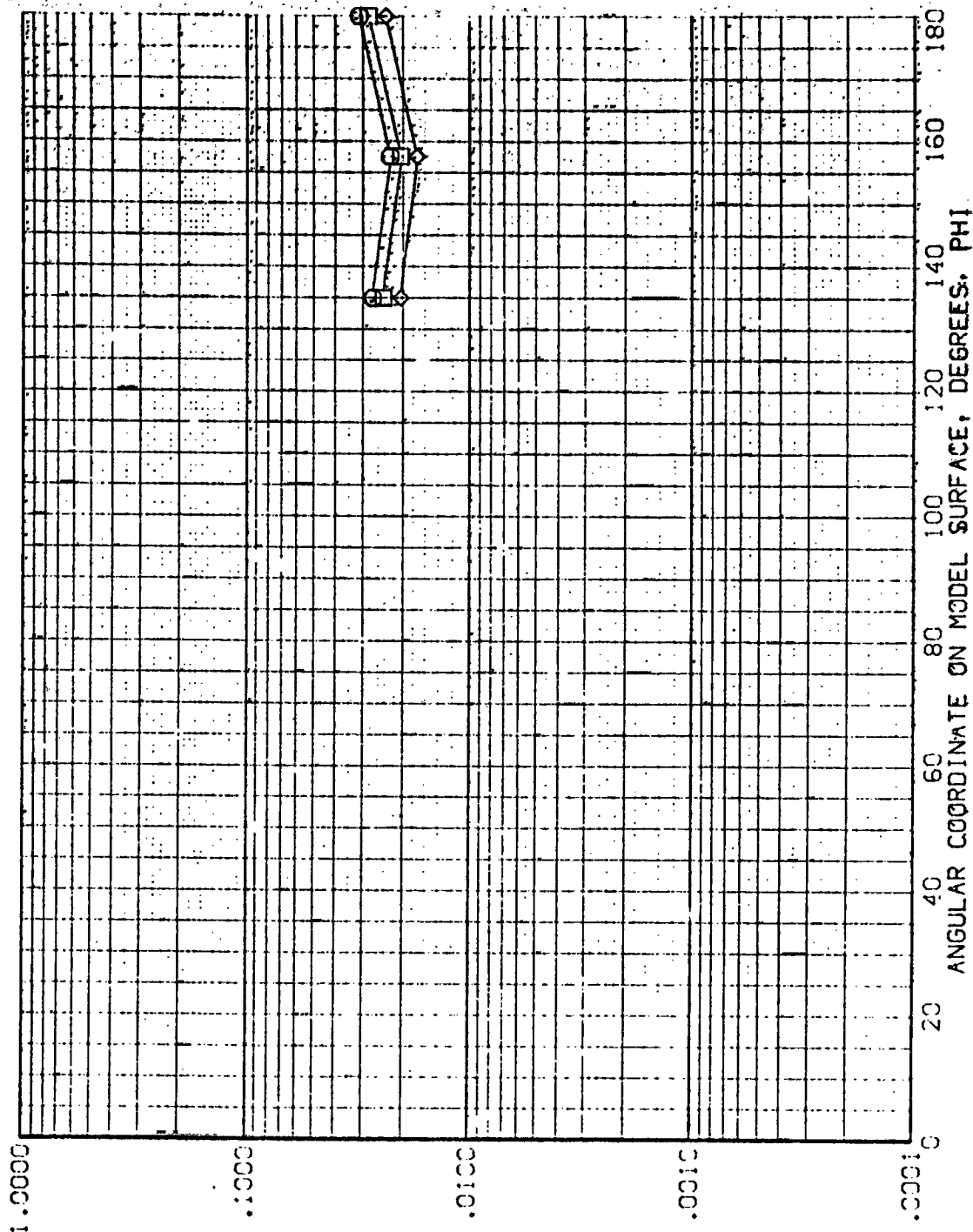


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AYES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV T09)

SYNOPSIS

PARAMETER

X/L .800 MACH 5.219

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

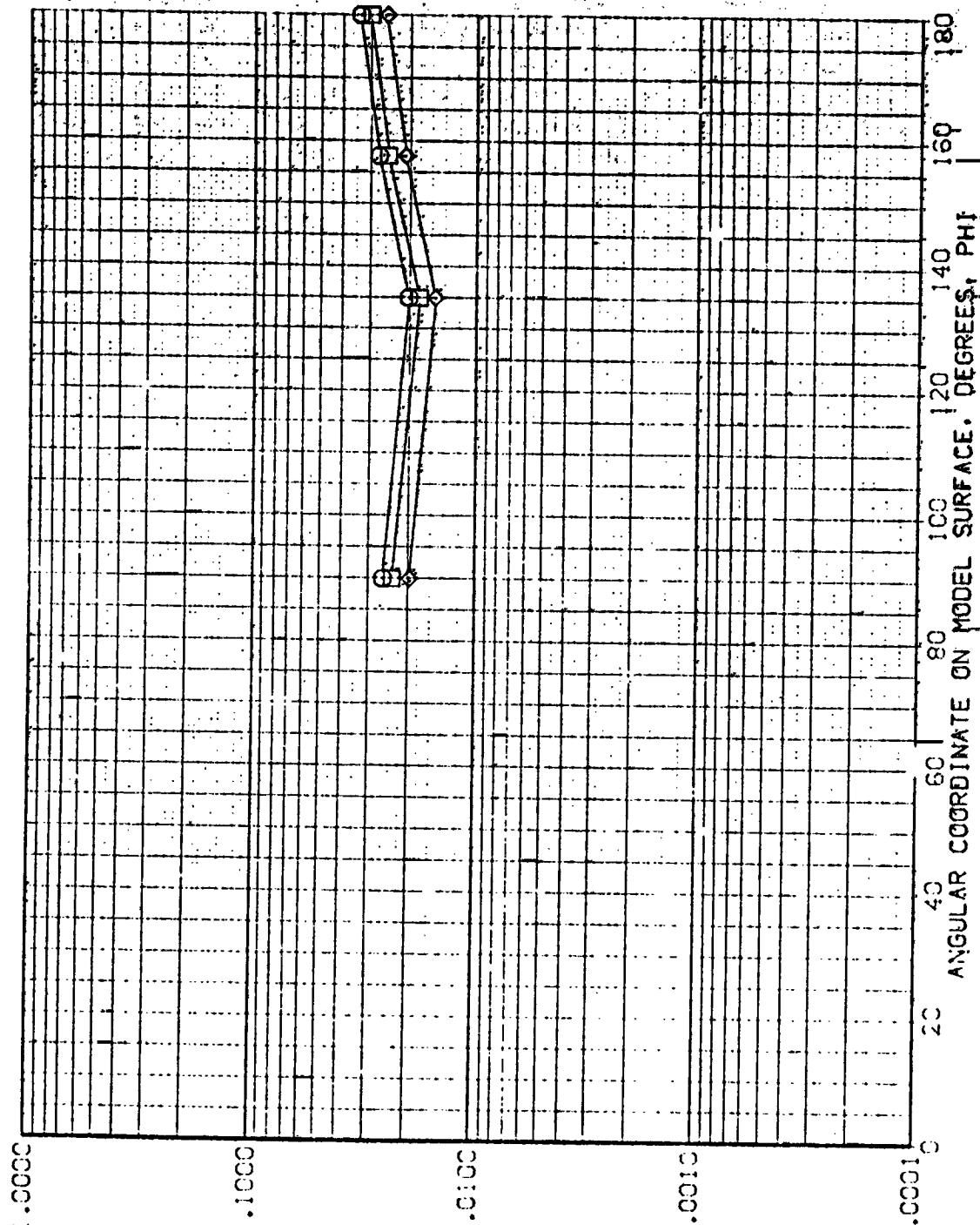


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-135 1429 01+11 EXTERNAL TANK

(REV109)

SYMBOL MAX/L Y/L YACH  
 .950 .850 5.219  
 .950 .850  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000  
 BETA 1.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

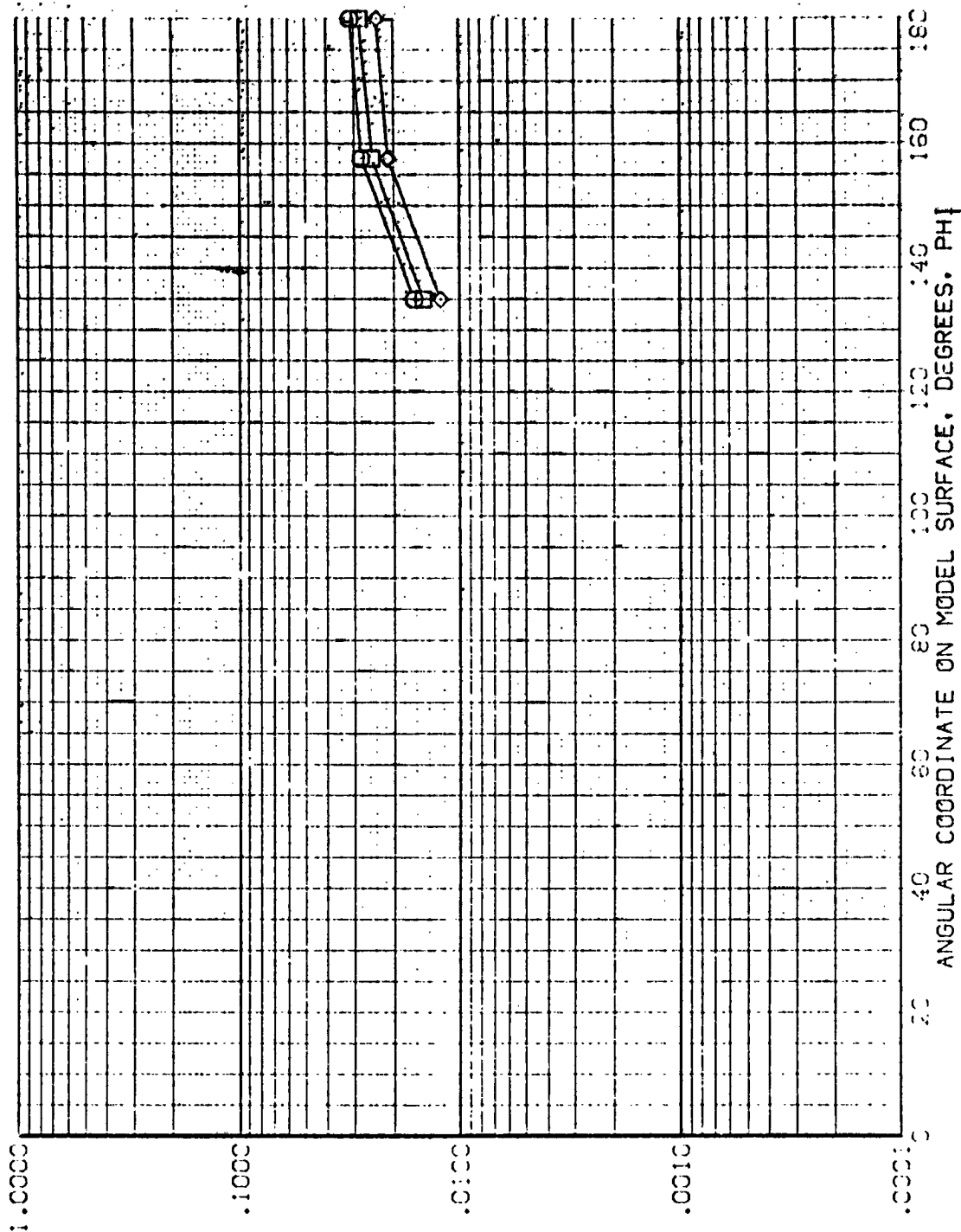


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+11 EXTERNAL TANK

(REV T09)

SVR-1  
 1.000  
 .950  
 .900  
 .850  
 .800  
 .750  
 .700  
 .650  
 .600  
 .550  
 .500  
 .450  
 .400  
 .350  
 .300  
 .250  
 .200  
 .150  
 .100  
 .050  
 .000

W/L  
 .800  
 .750  
 .700  
 .650  
 .600  
 .550  
 .500  
 .450  
 .400  
 .350  
 .300  
 .250  
 .200  
 .150  
 .100  
 .050  
 .000

PARAMETRIC VALUES  
 ALPHA -30.000  
 BETA 1.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

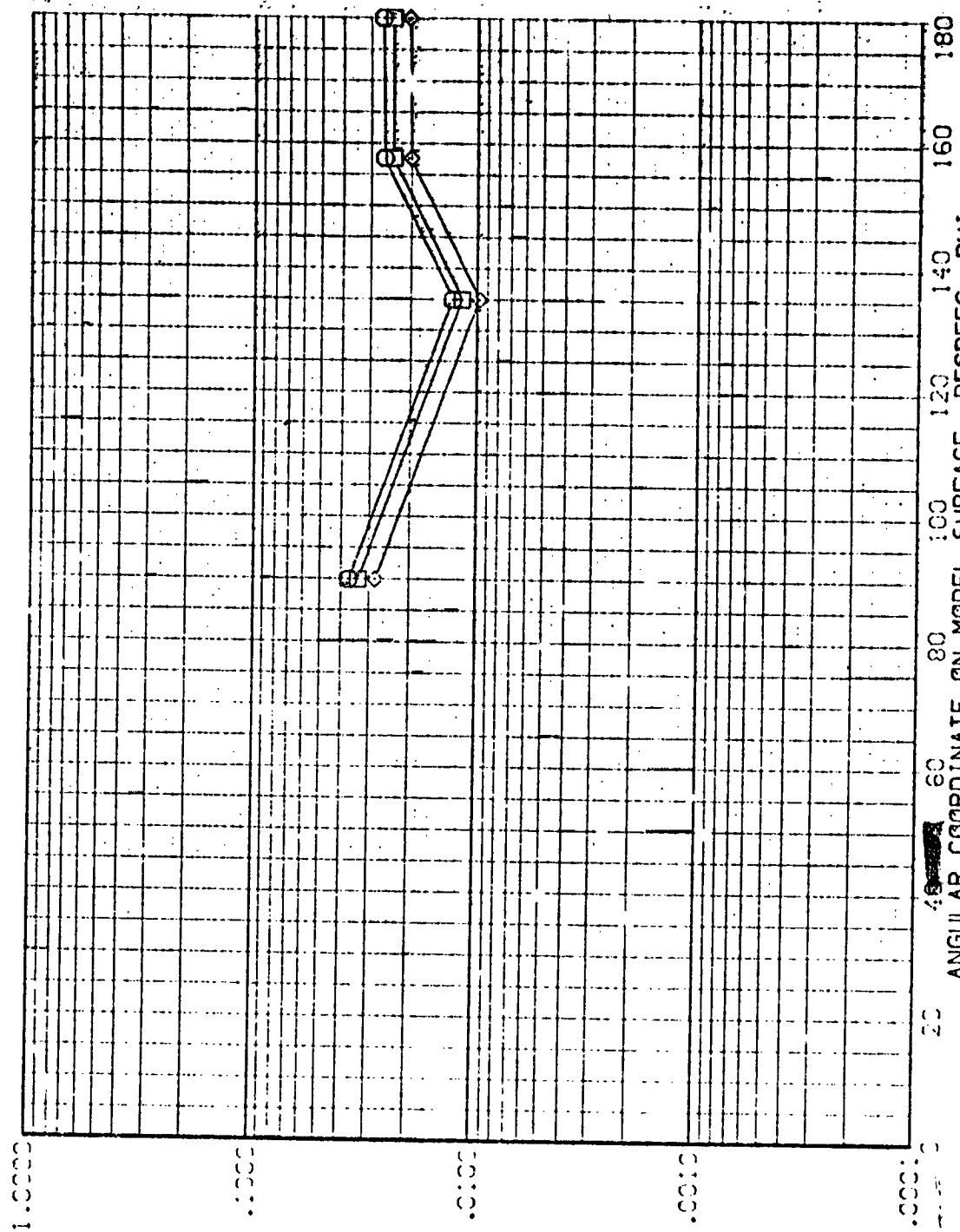


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REPRODUCIBILITY OF THIS  
 ORIGINAL PAGE IS POOR

AMES 3.5-195 1-29 01+11 EXTERNAL TANK

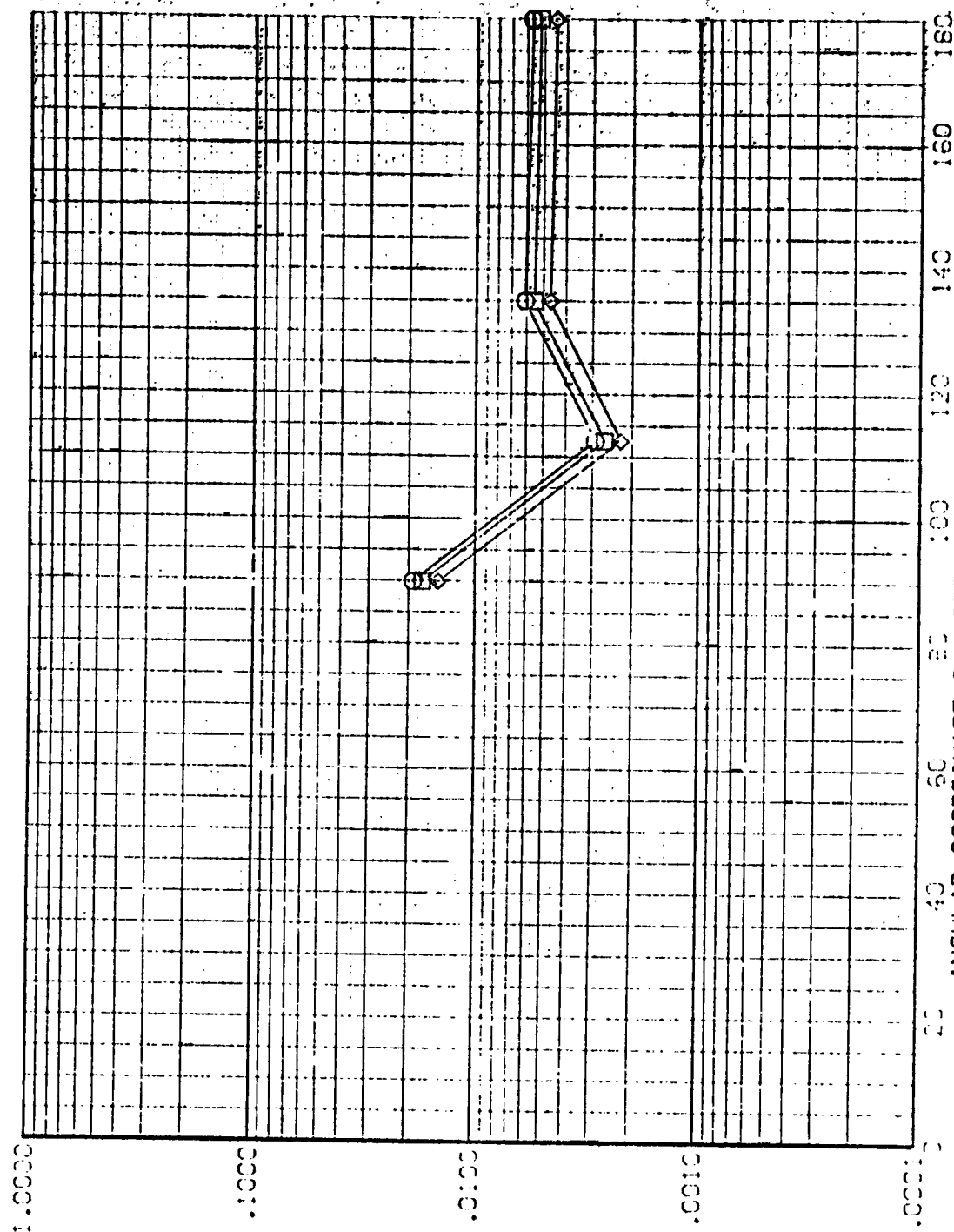
(REV110)

$\Delta T$   
 $\Delta T$   
 $\Delta T$   
 $\Delta T$

MAZ/T X/L VACH  
 .850 .350 5.300  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 PN/L 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF



ANGULAR COORDINATE ON MODEL SURFACE, DEGREES, PHI

FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1H28 01+11 EXTERNAL TANK

(REV 10)

SV200  
-A2/H2  
.650  
.400  
5.300  
1.000

W/L  
.400  
5.300

PARAMETRIC VALUES  
60.00 BETA  
4.000

ALPHA  
60.00  
60.00

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

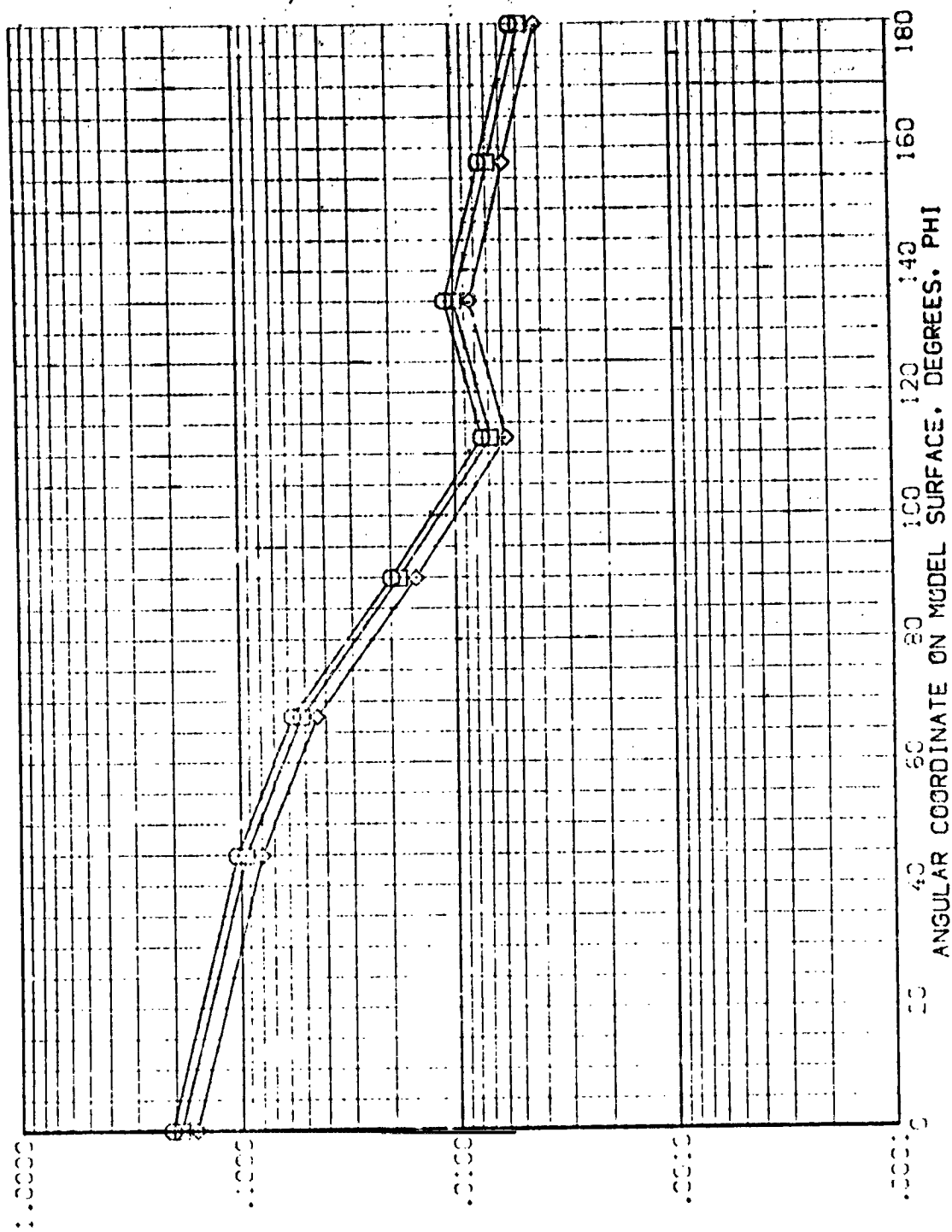


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-125 1H28 01+T1 EXTERNAL TANK

(REV110)

SYMBOL HAM/FT  
 .800  
 .900  
 1.000

V/L MACH  
 .400 5.300

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 RV/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

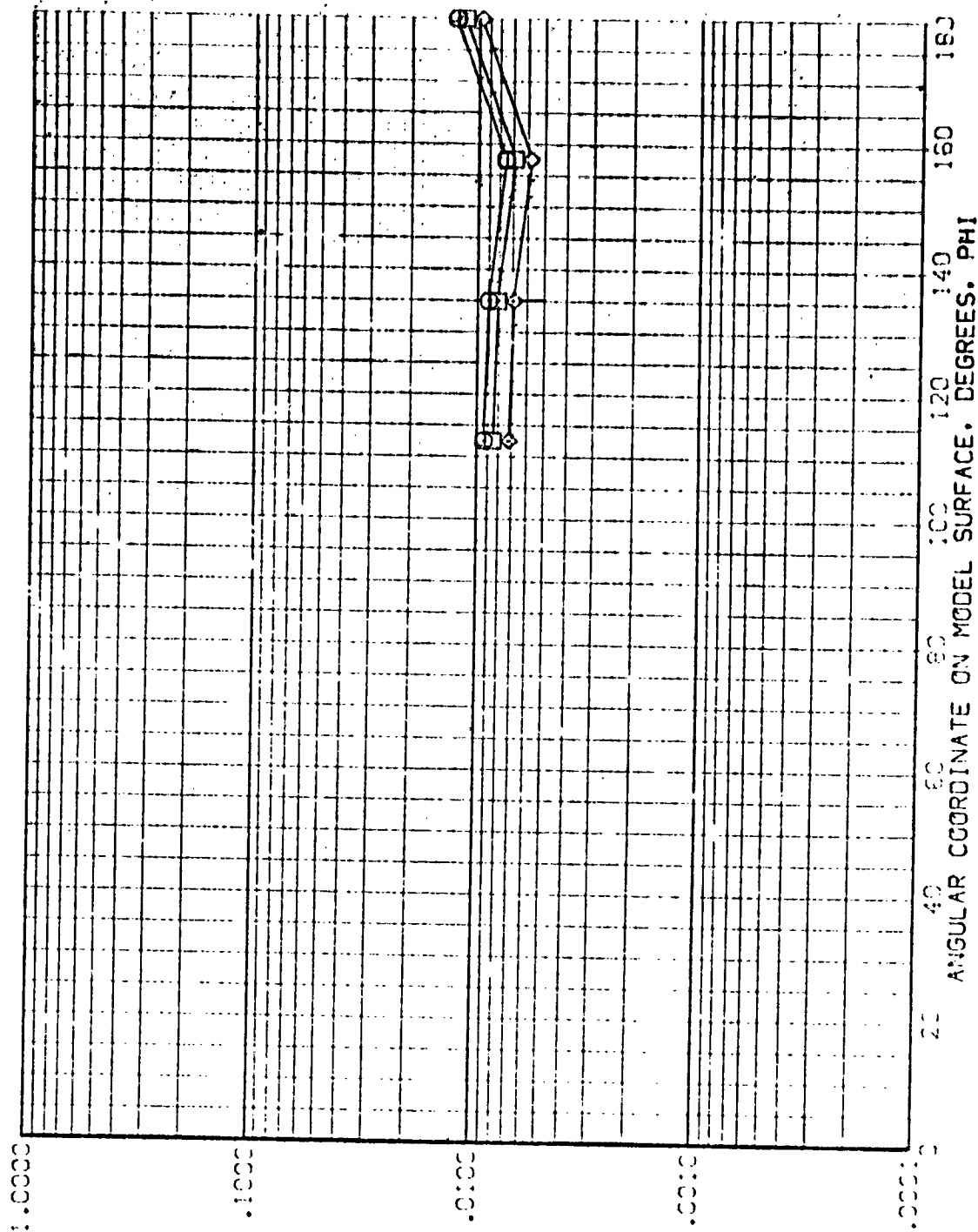


FIG. 5 TANK IN THE PRESENCE OF ORBITER



YES 3.5-195 1-29 01+11 EXTERNAL TANK

(REV:100)

PARAMETRIC VALUES  
 ALPHA 60.000 BETA 4.000  
 80.000 1.000 5.000  
 90.000 1.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

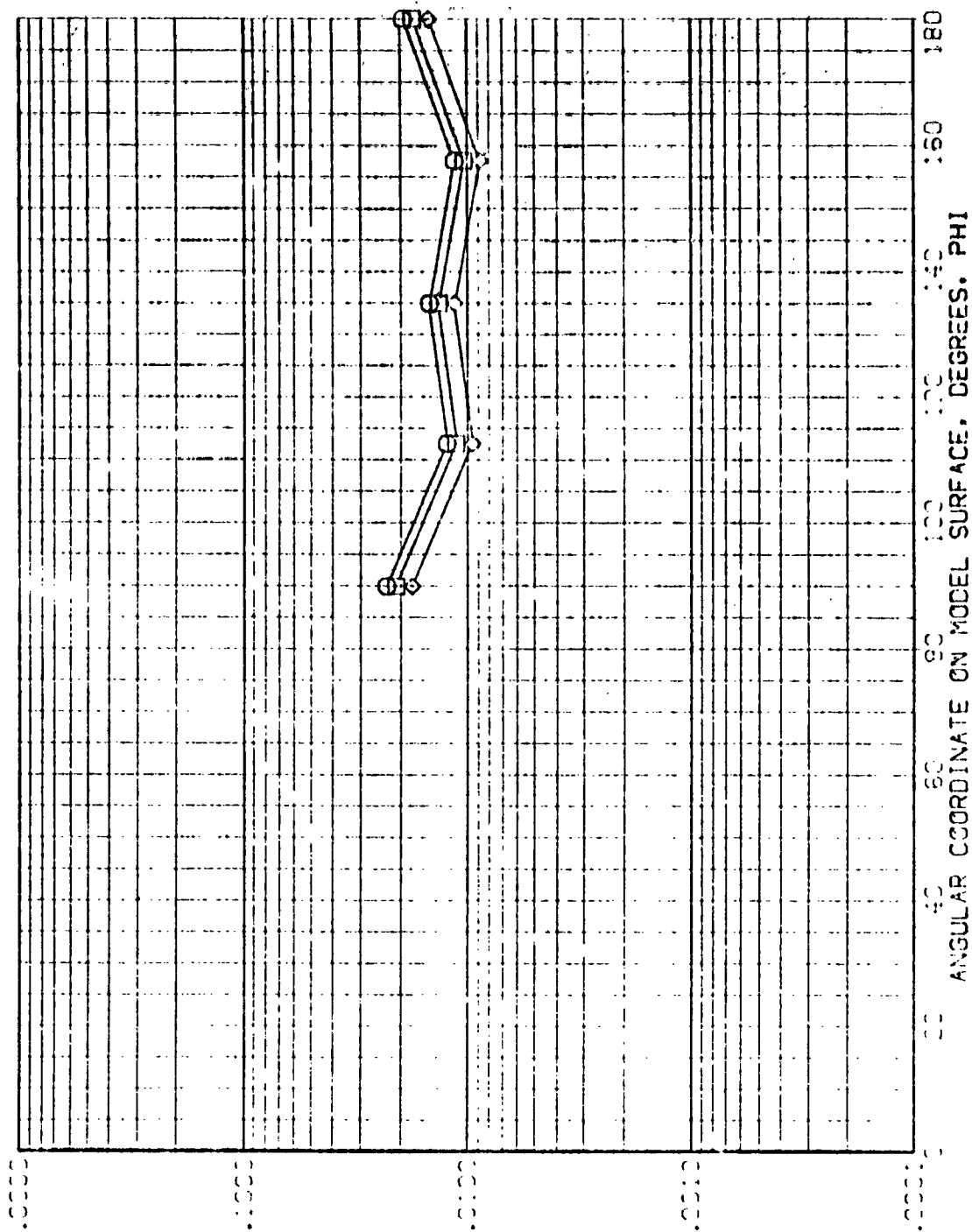


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01-T1 EXTERNAL TANK (REV110)

SIZE: 11x17  
 DATE: 10/1/88  
 BY: JAL  
 VCH: 5.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 4.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

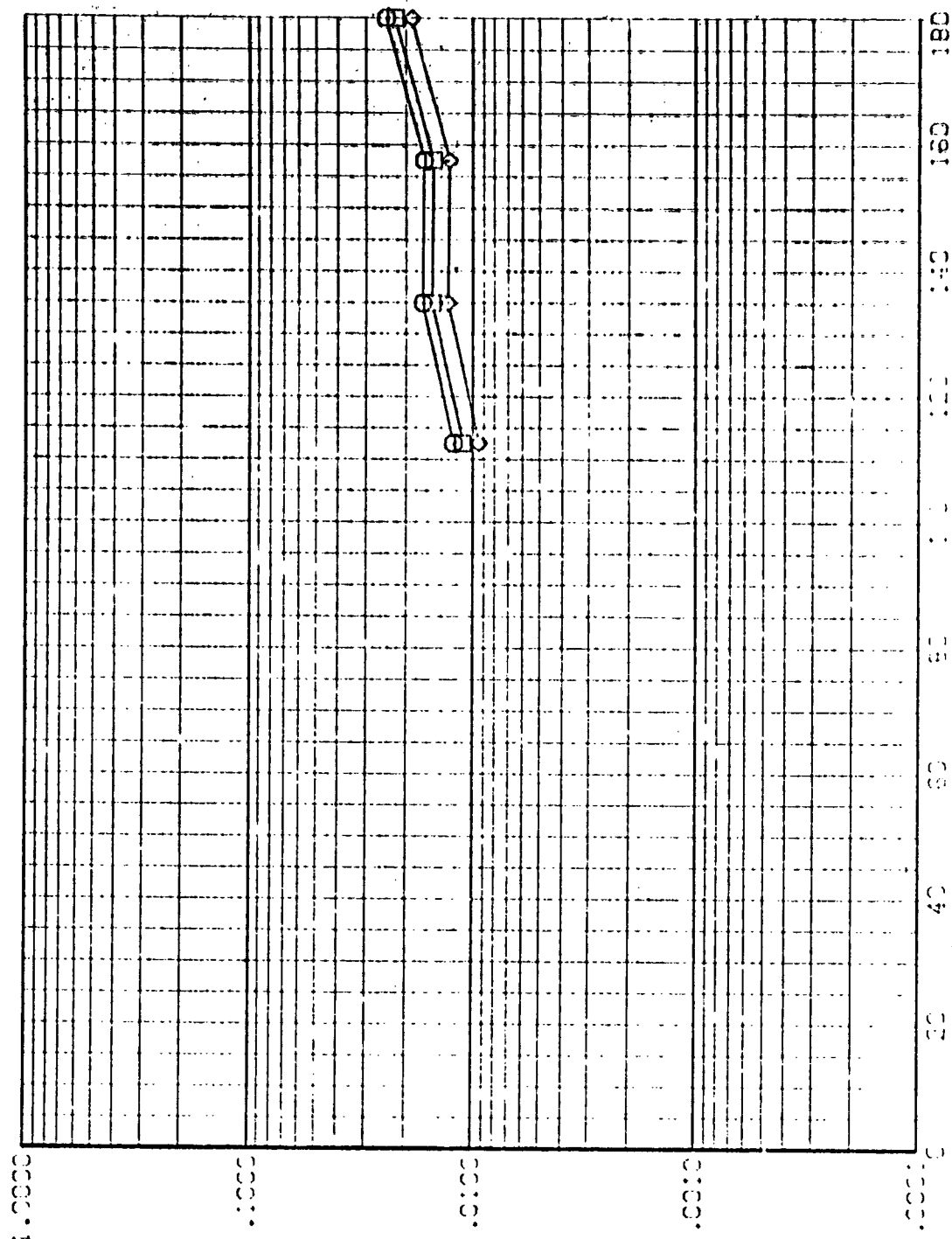


FIG. 5 TANK IN THE PRESENCE OF ORBITER

SYNOPSIS	WAVE	X/L	MACH	PARAMETRIC VALUES
1.000	.850	.600	5.300	ALPHA 60.000
	.900			BETA 4.000
	1.000			RV/L .000

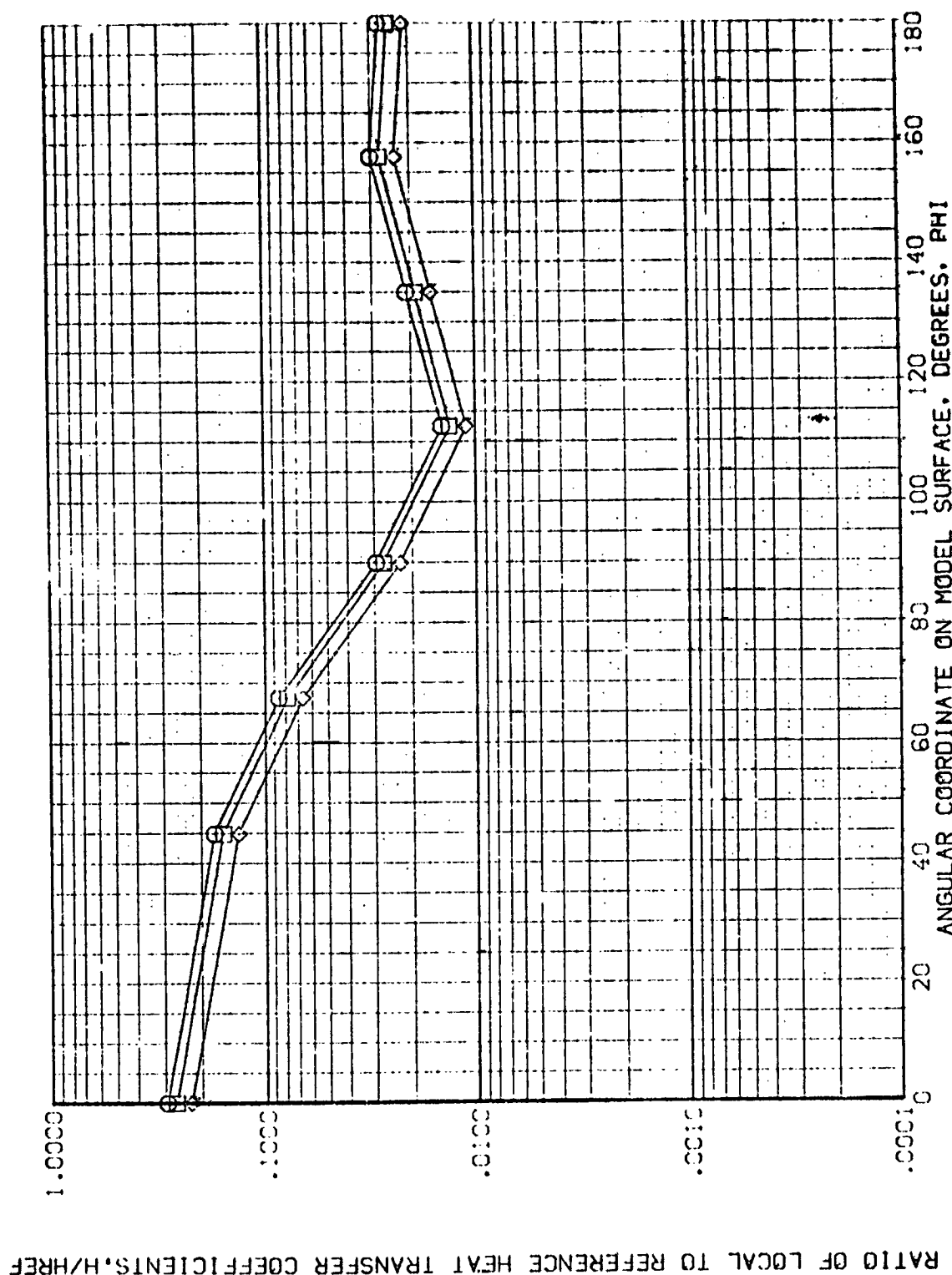


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REPRODUCIBILITY OF THIS  
ORIGINAL PAGE IS 100%

AMES 3.5-155 IH28 01+T1 EXTERNAL TANK

(REV110)

SYMBOL

HAIR/HT  
.850  
.950  
1.000

X/L

.650

MACH

5.300

PARAMETRIC VALUES

ALPHA  
RN/L

BETA  
4.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

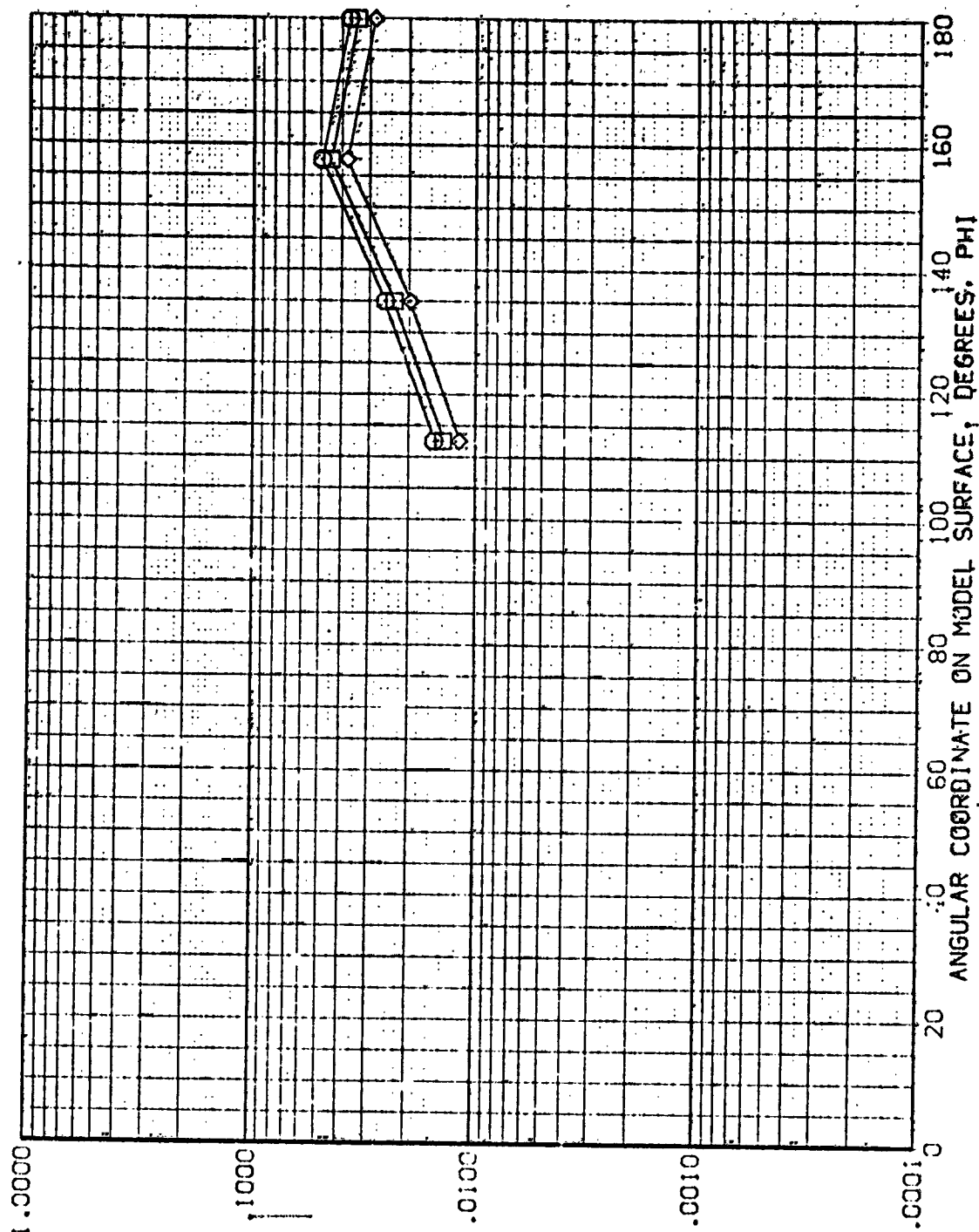


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV10)

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 4.000  
 RV/L .000

SYSEC- HAM/HT X/L MACH  
 .850 .700 5.300  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

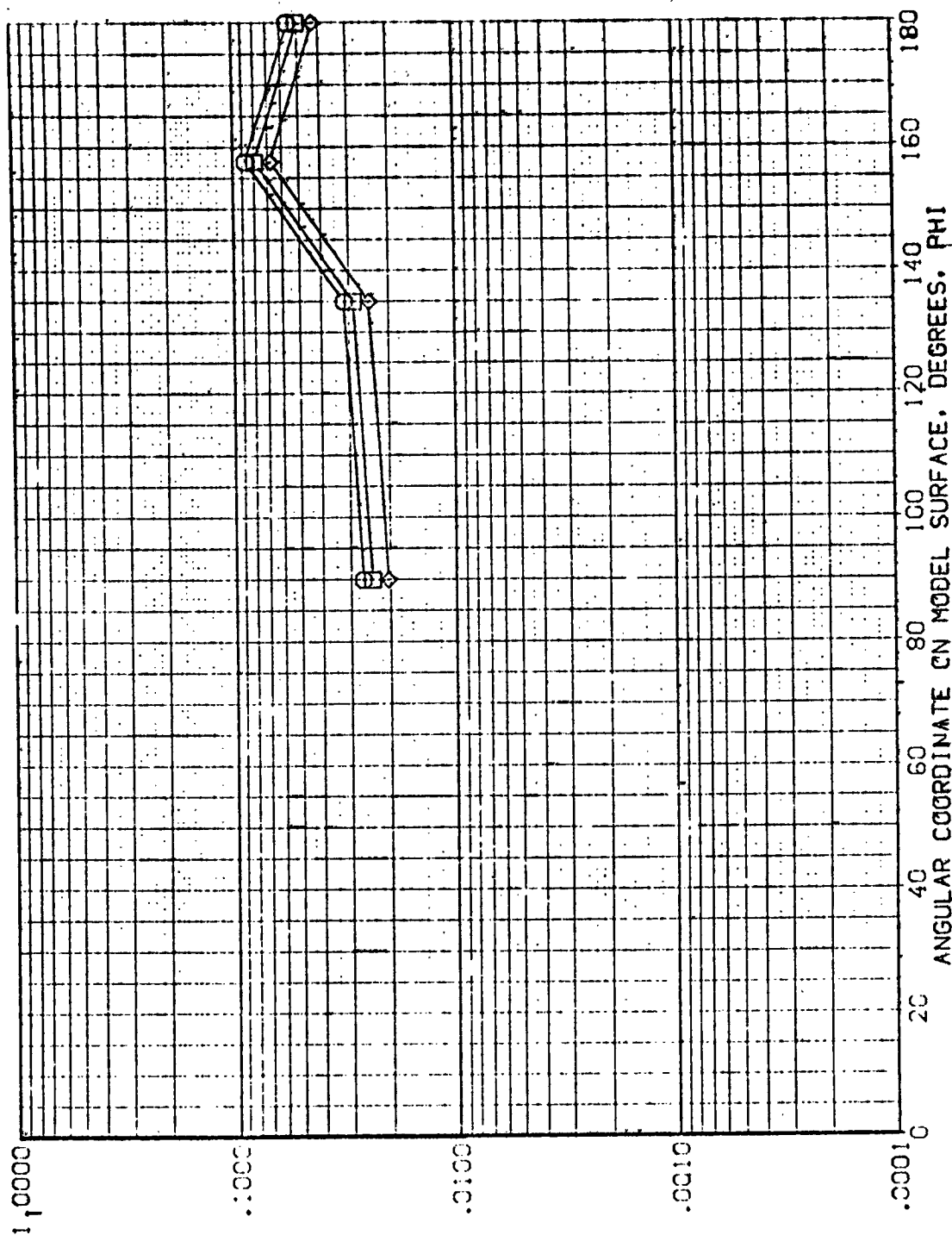


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AXES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV110)

PARAMETRIC VALUES  
 ALPHA 60.000  
 PV/L 4.000  
 BET& .000

SYMBOLS  
 X/L .850  
 Y/L .750  
 Z/L 5.300  
 W/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

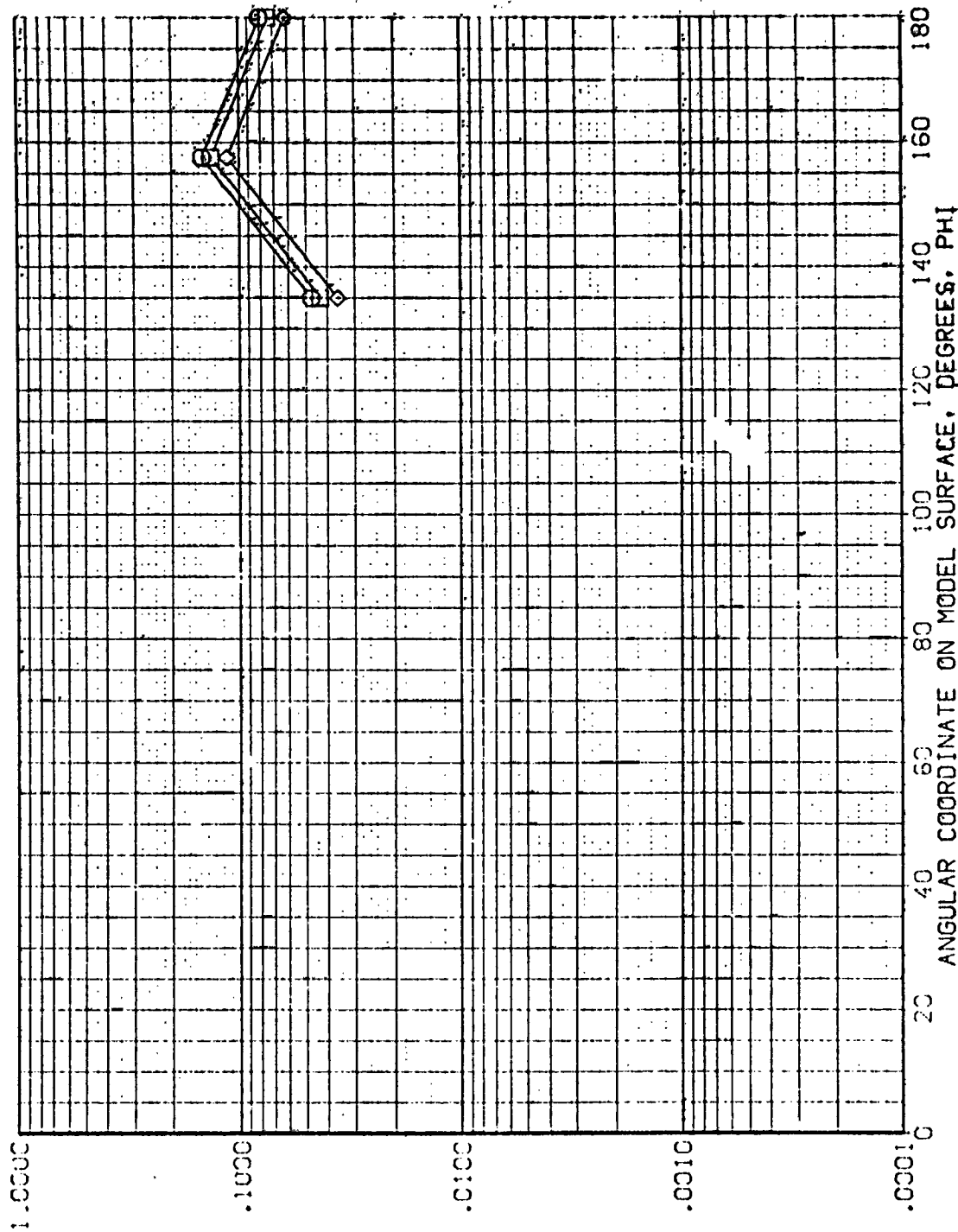


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

ANES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV110)

SYMBOL

H/W/HT

X/L

MACH

.850  
.900  
1.000

.800

3.300

ALPHA  
PR/L

PARAMETRIC VALUES

50.000  
4.000

BETA

1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

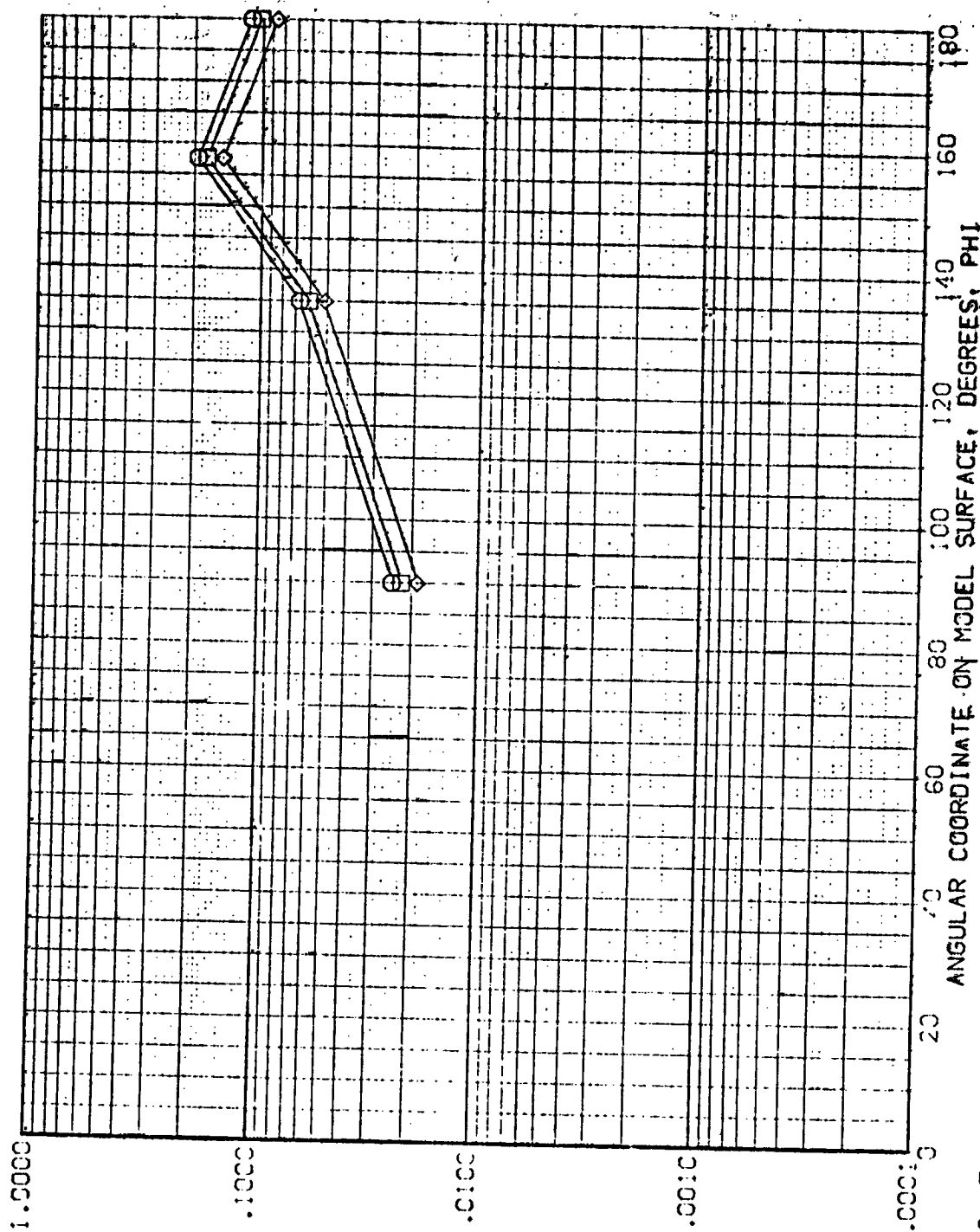


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV10)

SVWC- MAX/WT X/L MACW  
1850 .850 5.300  
1950  
1.000

PARAMETRIC VALUES  
ALPHA 60.000 BETA .000  
RN/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

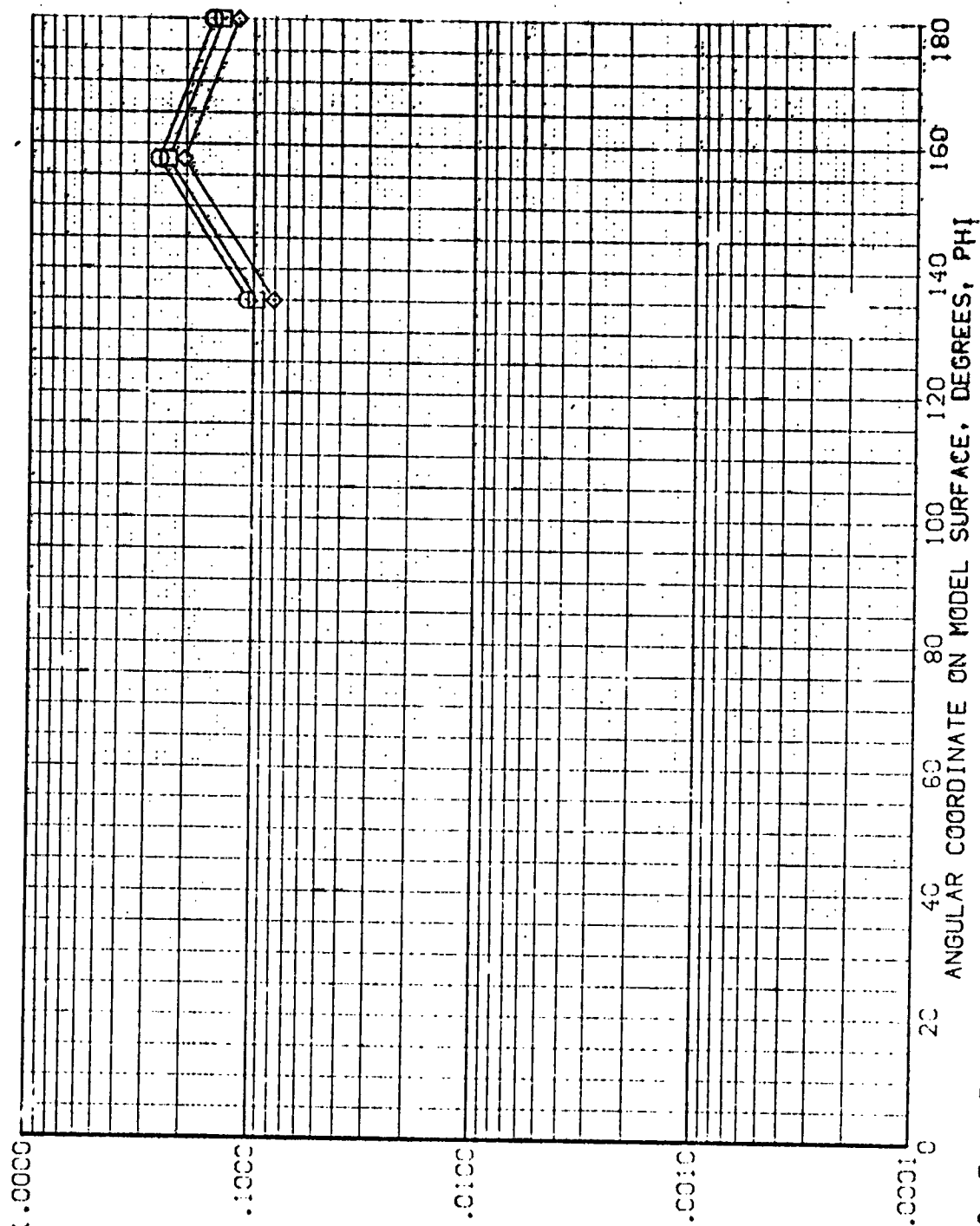


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



SYMBOL	WALL THICKNESS	K/L	MACH	PARAMETRIC VALUES
◇	.850	.900	5.300	ALPHA 60.000
◇	.900			BETA 4.000
◇	1.000			

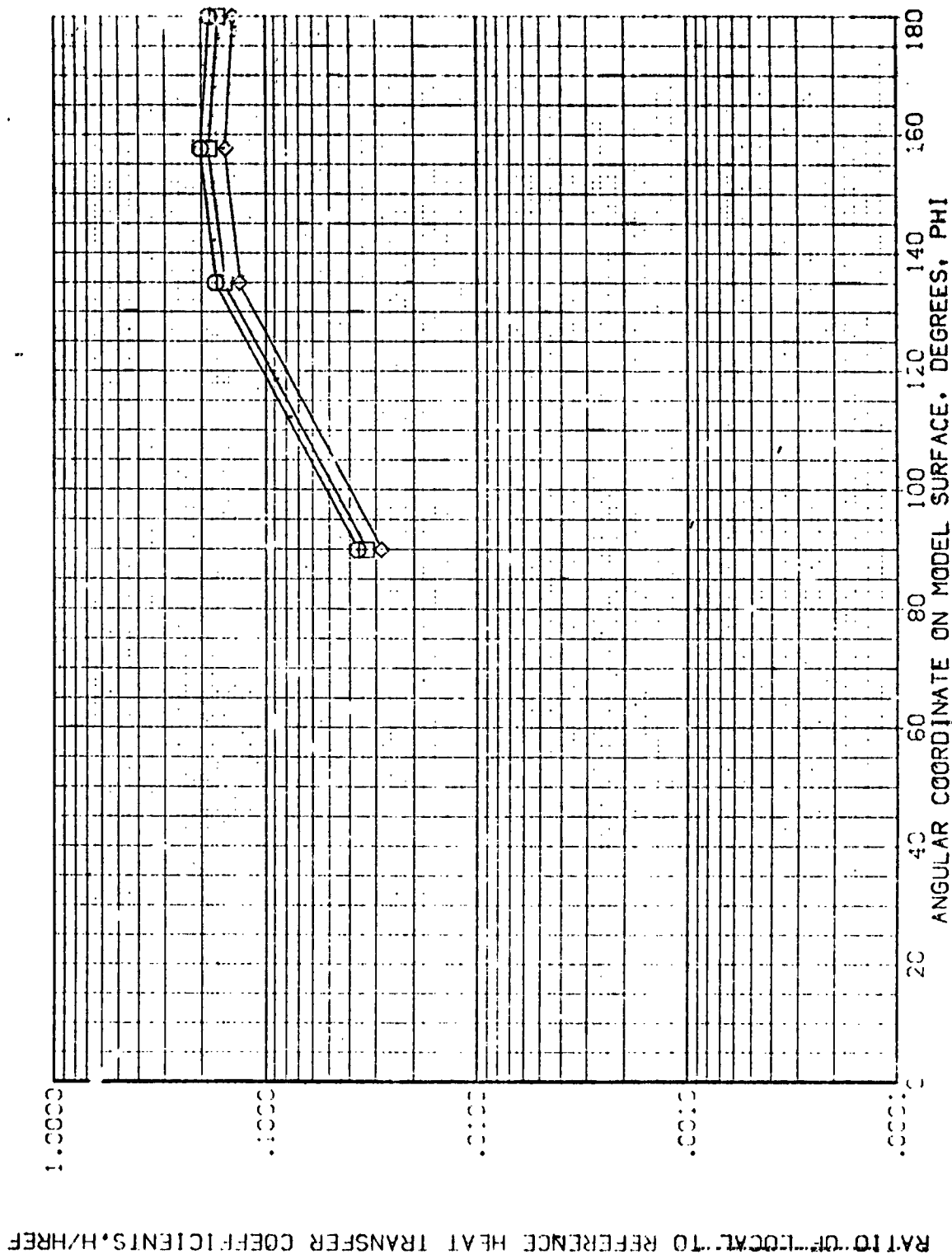


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01+11 EXTERNAL TANK

(REV111)

PARAMETRIC VALUES	ALPHA	BETA
30.770	4.000	
RN/L		

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

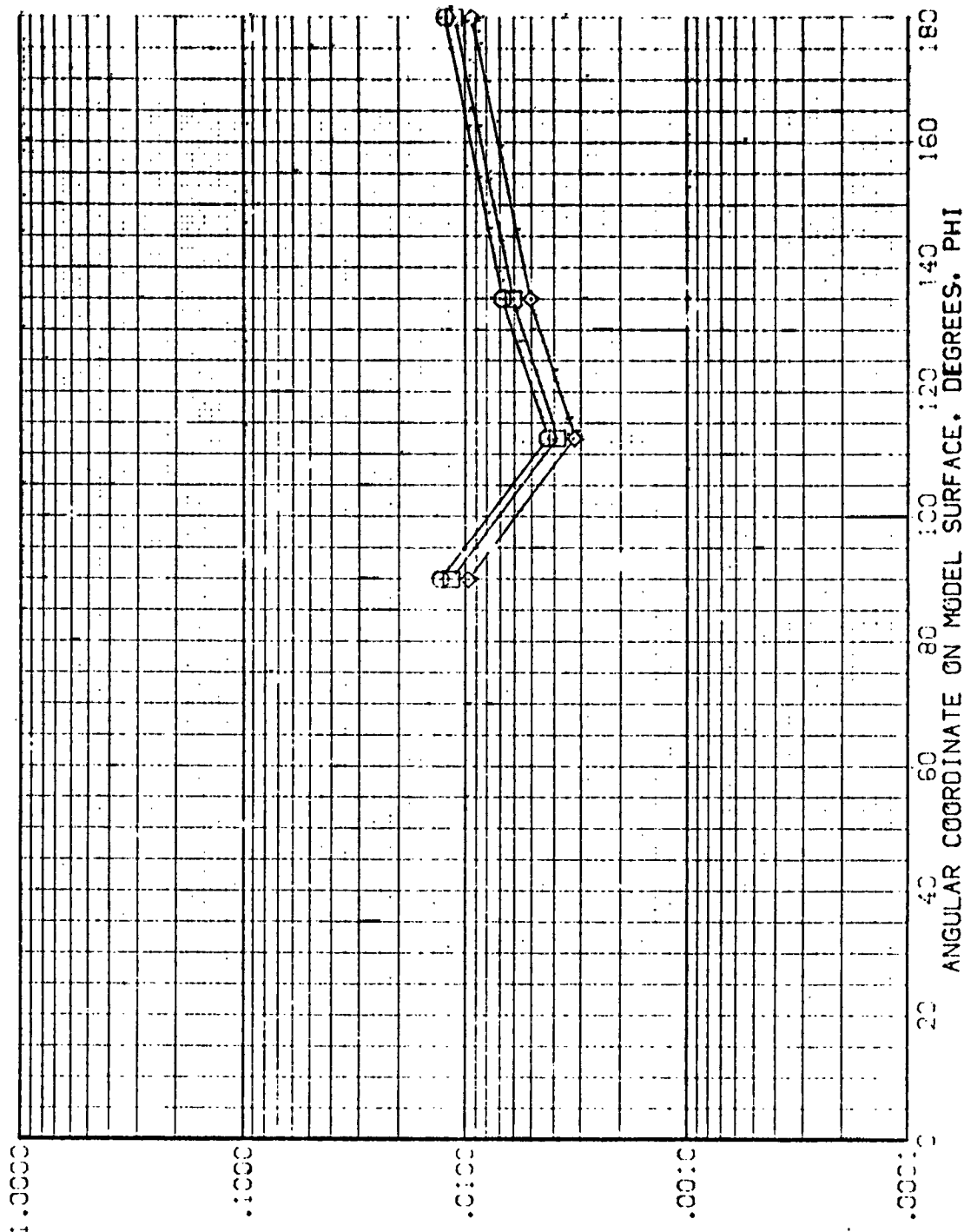


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV111)

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 4.000

SWEEP H<sub>1</sub>/H<sub>2</sub> X/L MACH  
 1.000 .800 .400 5.300  
 1.000 .900 .400 5.300  
 1.000 1.000 .400 5.300

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

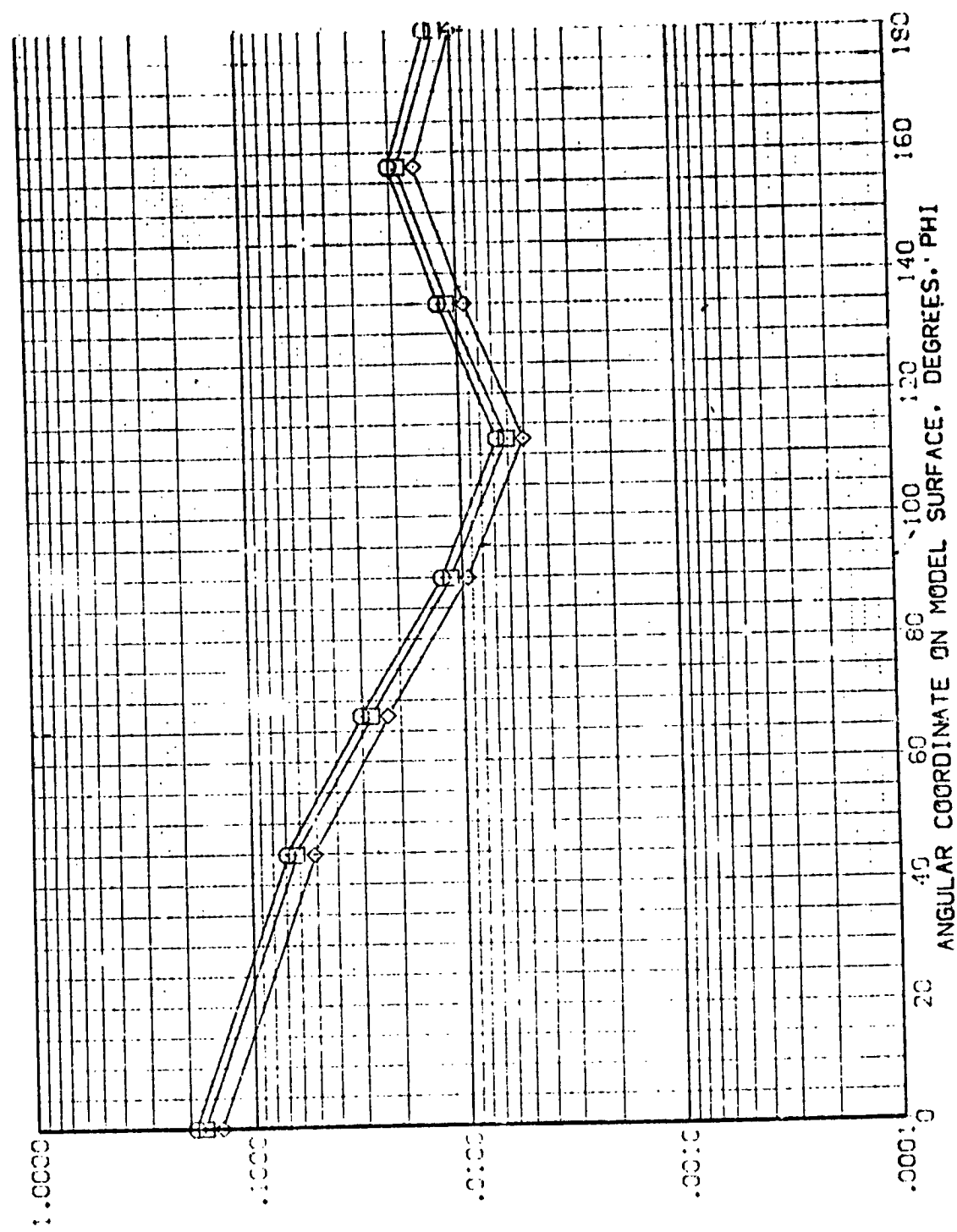


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

REF: JPL 70-100  
 ORIGINAL PAGE IS

ANES 3.5-195 :H28 C1+T1 EXTERNAL TANK

(RE.T11)

SAVEC  
-44/-7  
.850  
.900  
1.000

K/L  
.450

MACH  
5.300

PARAMETRIC VALUES  
ALPHA  
RN/L  
30.000  
4.000  
BETA

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

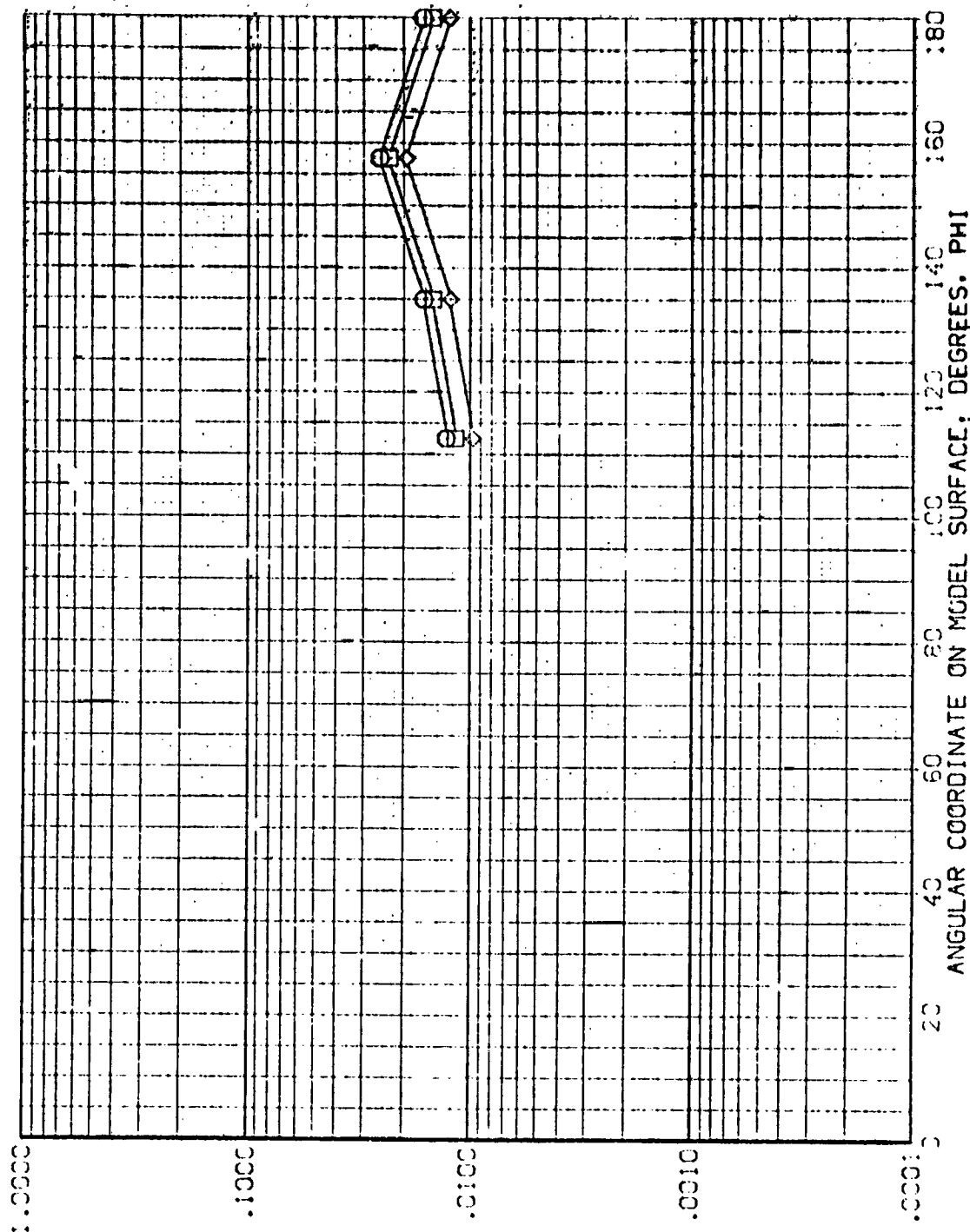


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV111)

SVV21-  
0.000  
0.000  
0.000  
0.000

W/L .503 MACH 5.300

PARAMETRIC VALUES  
30.000 BETA  
4.000

ALPHA  
RN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

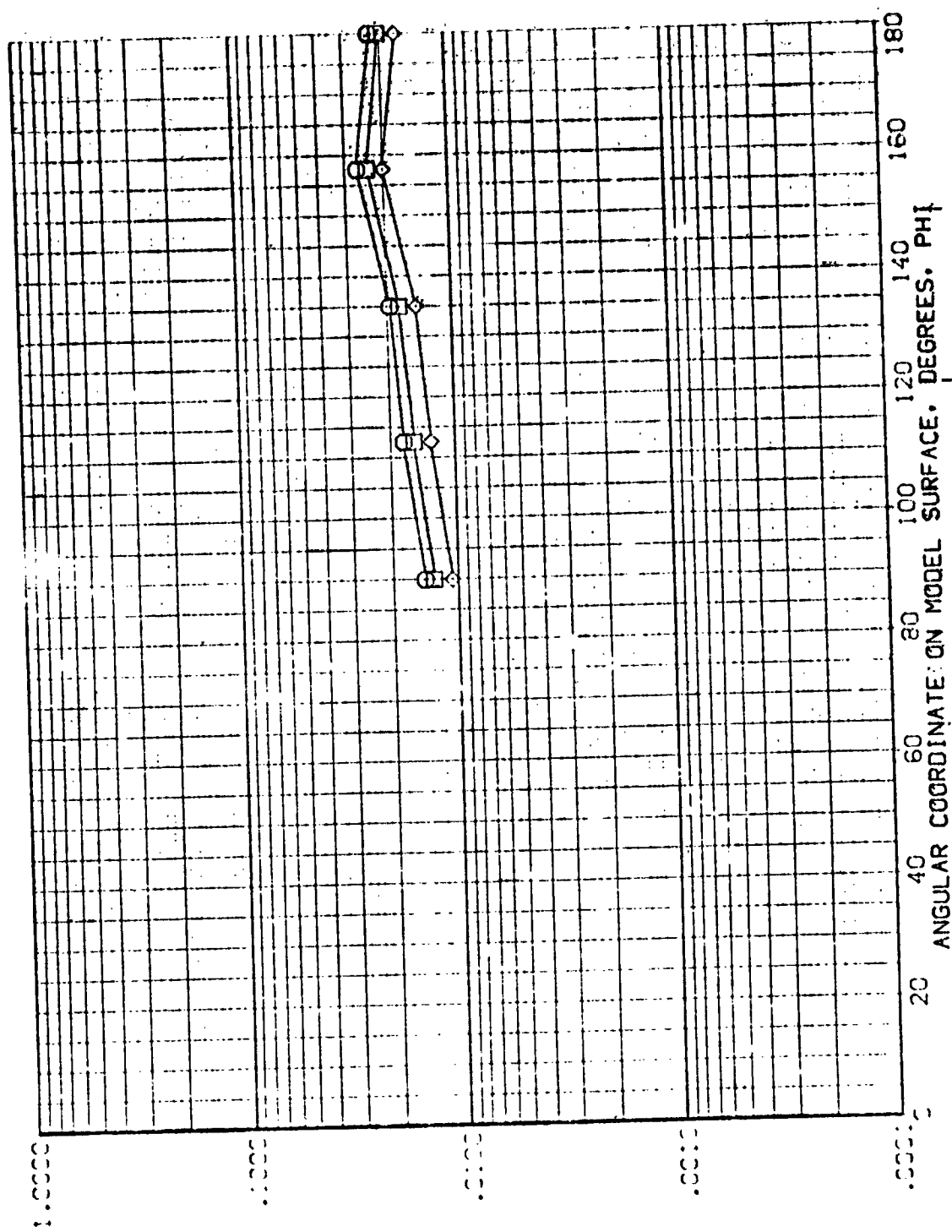


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AMES 3.5-195 1H20 01+T1 EXTERNAL TANK (REV711)

WAVE	WAVE/REF	WAVE	WAVE
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

PARAMETRIC VALUES

ALPHA	BETA
0.000	0.000
0.000	0.000

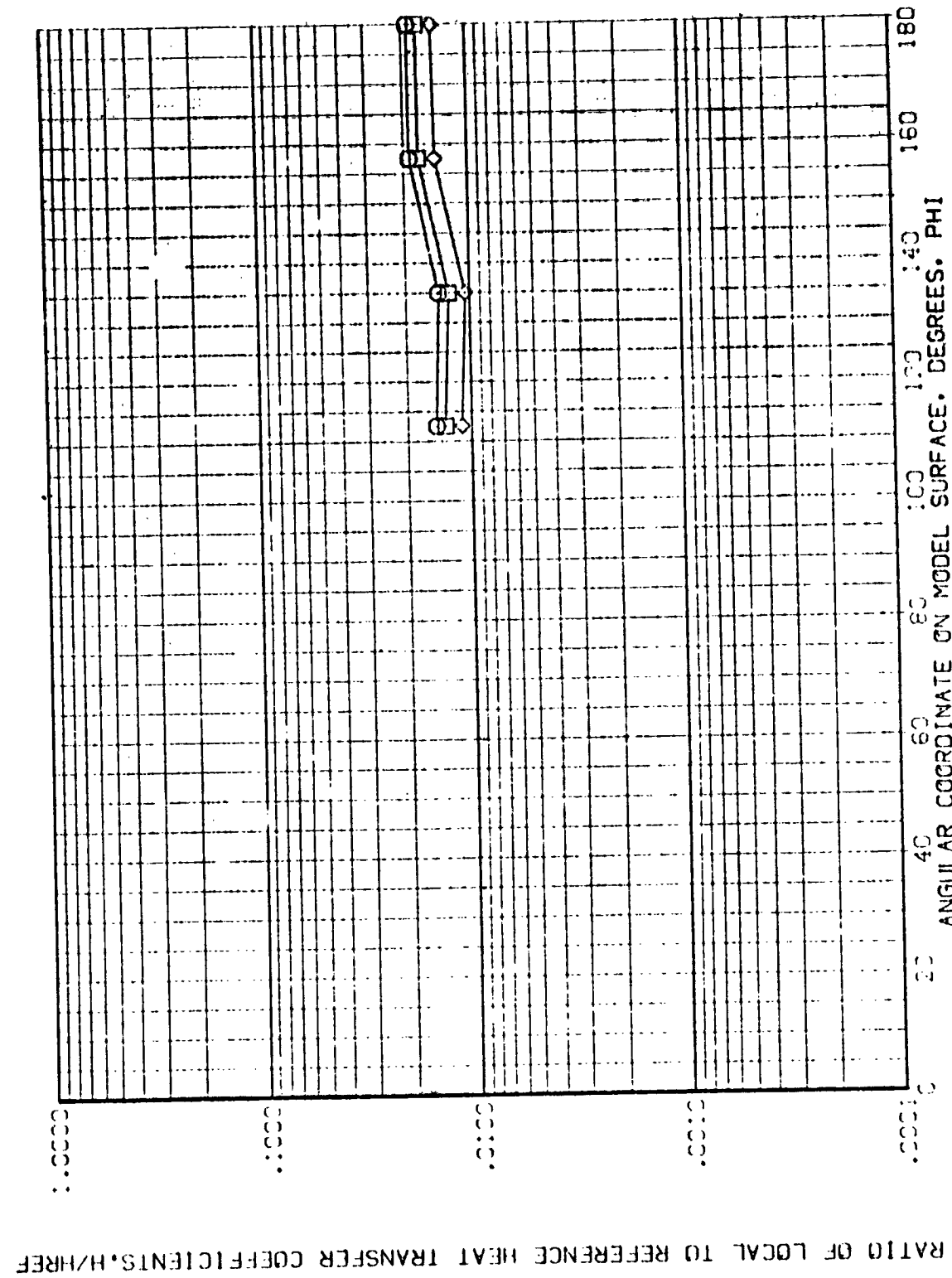


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

PAGE 297

AVES 3.5-195 1428 C1+T1 EXTERNAL TANK

(REVT111)

PARAMETRIC VALUES  
ALPHA 33.000 BETA .000  
P%/L 4.000

SI/VECT  
X/L .600 VACH 5.300  
Y/L .000  
Z/L .000  
W/L .000

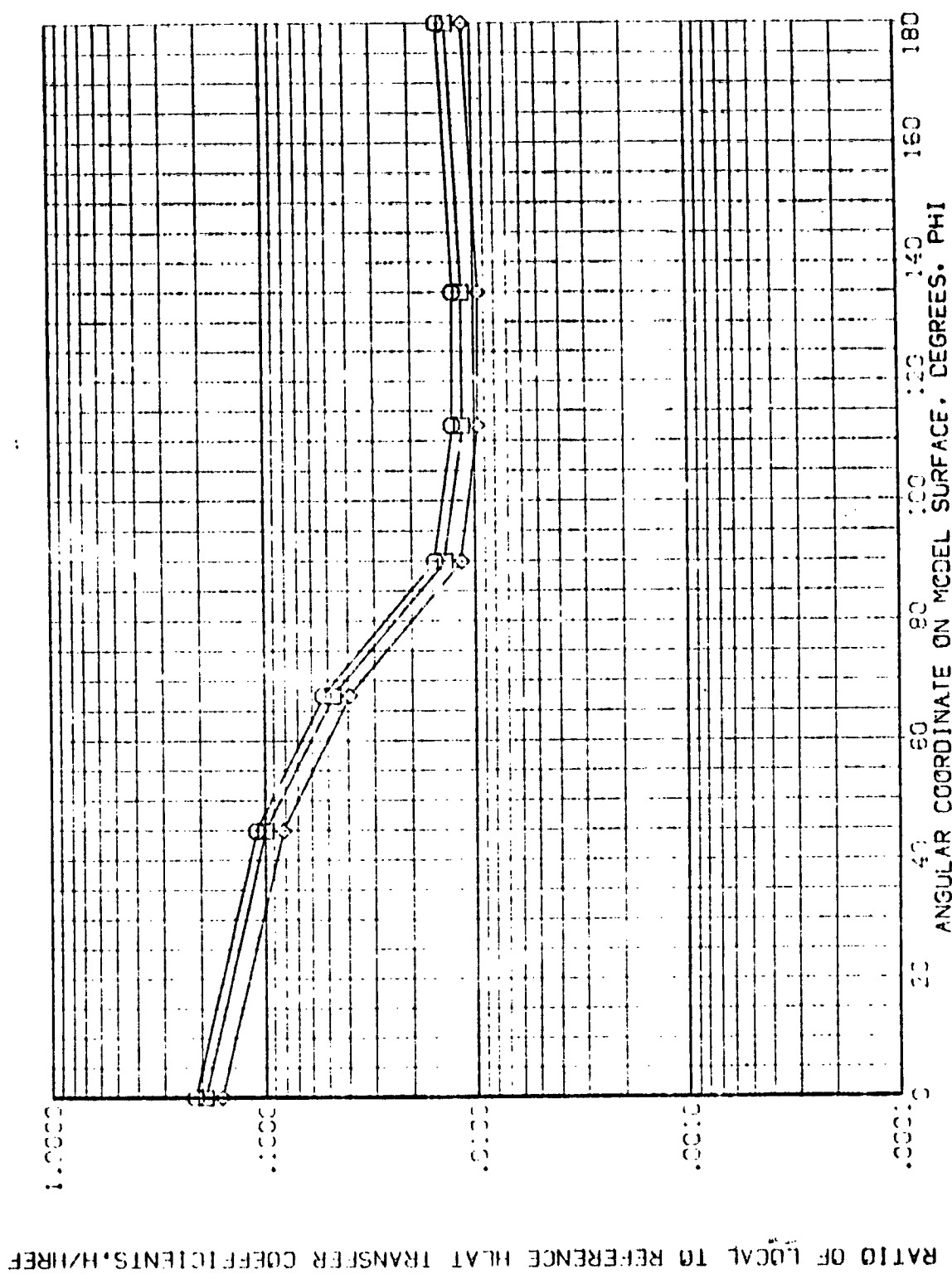
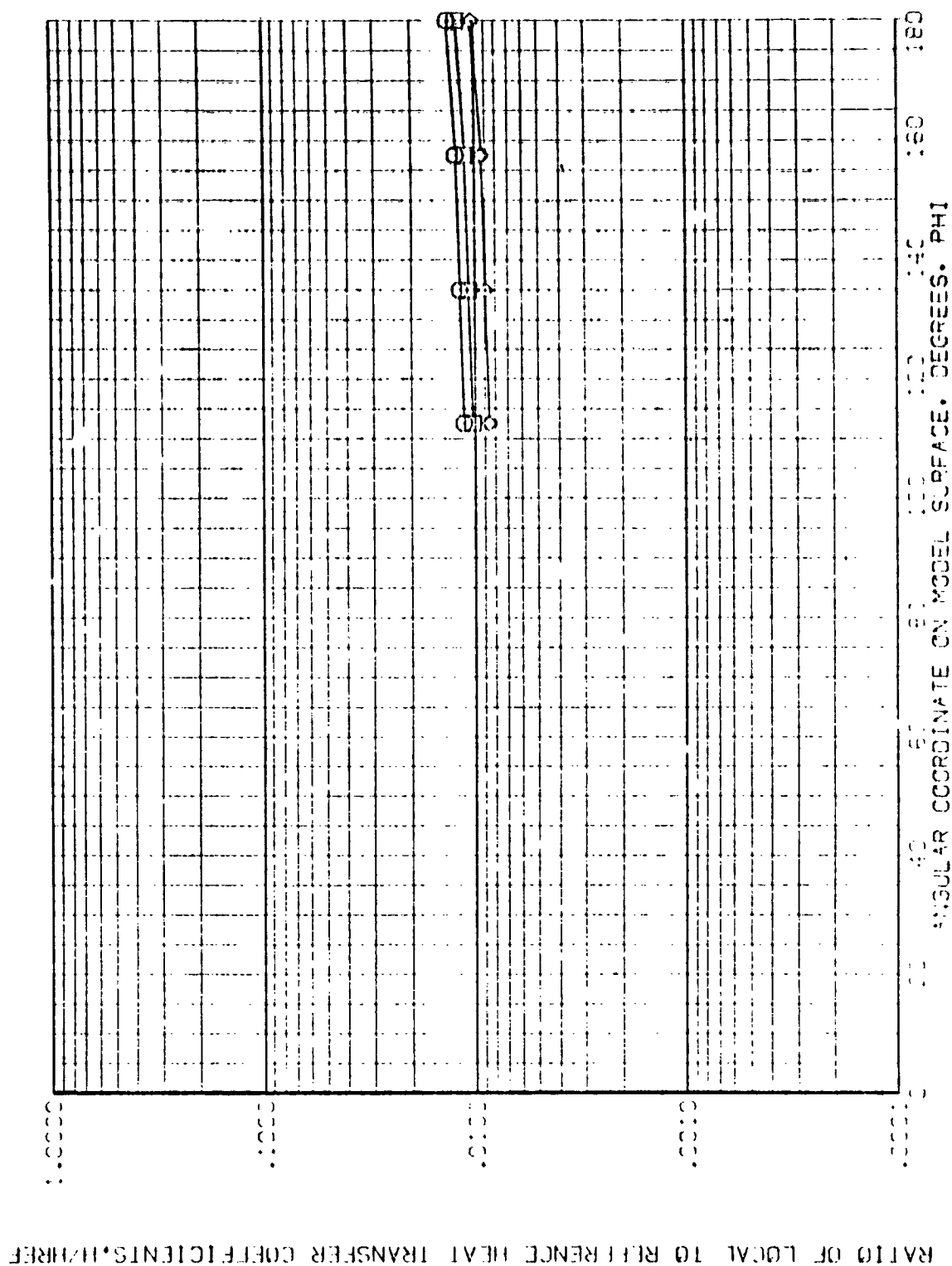


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

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PARAMETRIC VALUES		
ALPHA	30.000	BETA
RVAL	4.000	



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77  
88  
99



PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 4.000  
 PIV/L .000

MODEL H/W-T X/L MACH  
 .850 .700 5.300  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

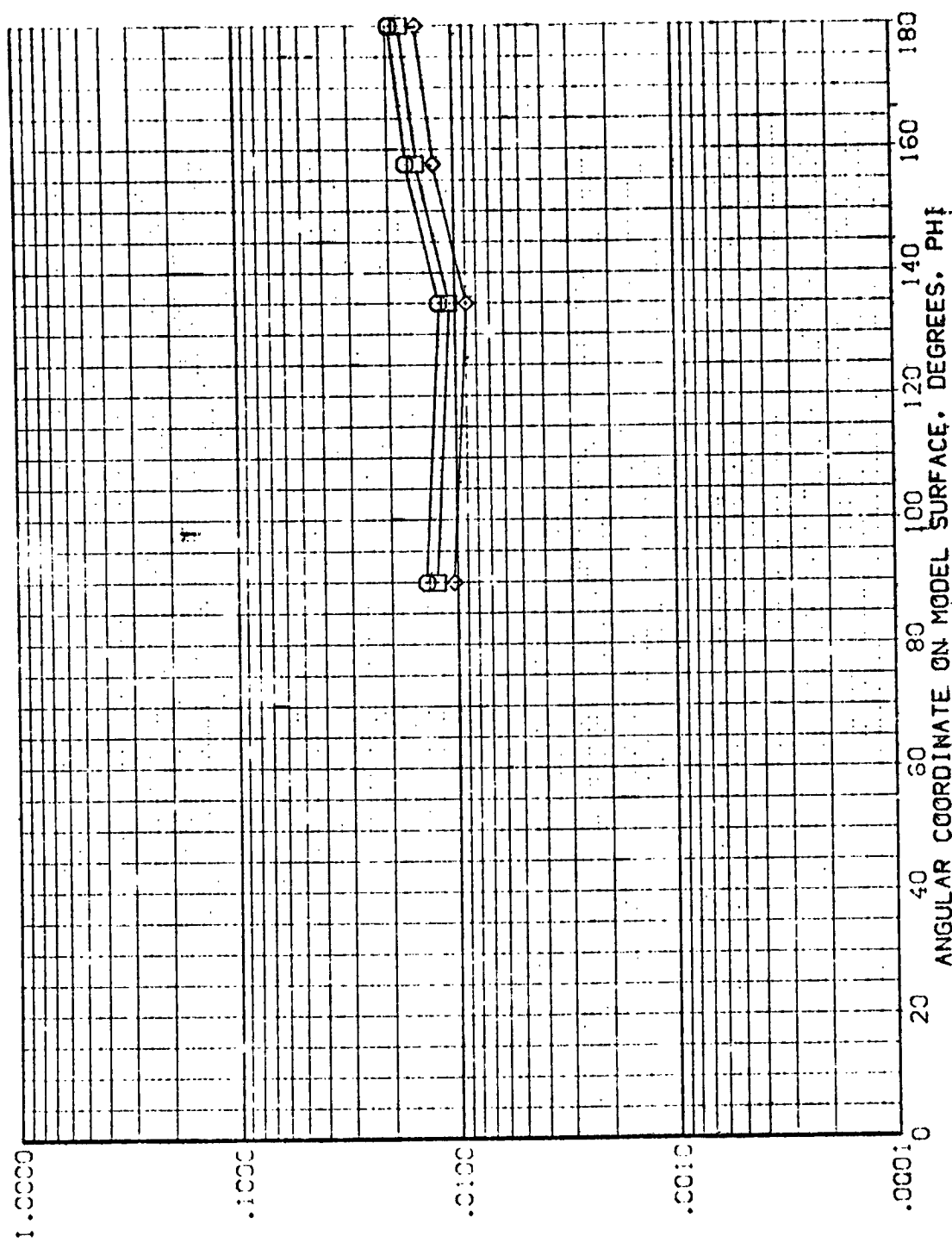


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV 11)

SYNOPSIS  
 HEIGHT  
 .850  
 .900  
 1.000

X/L  
 .750  
 MACH  
 5.300

PARAMETRIC VALUES  
 ALPHA  
 PNT  
 30.000  
 4.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

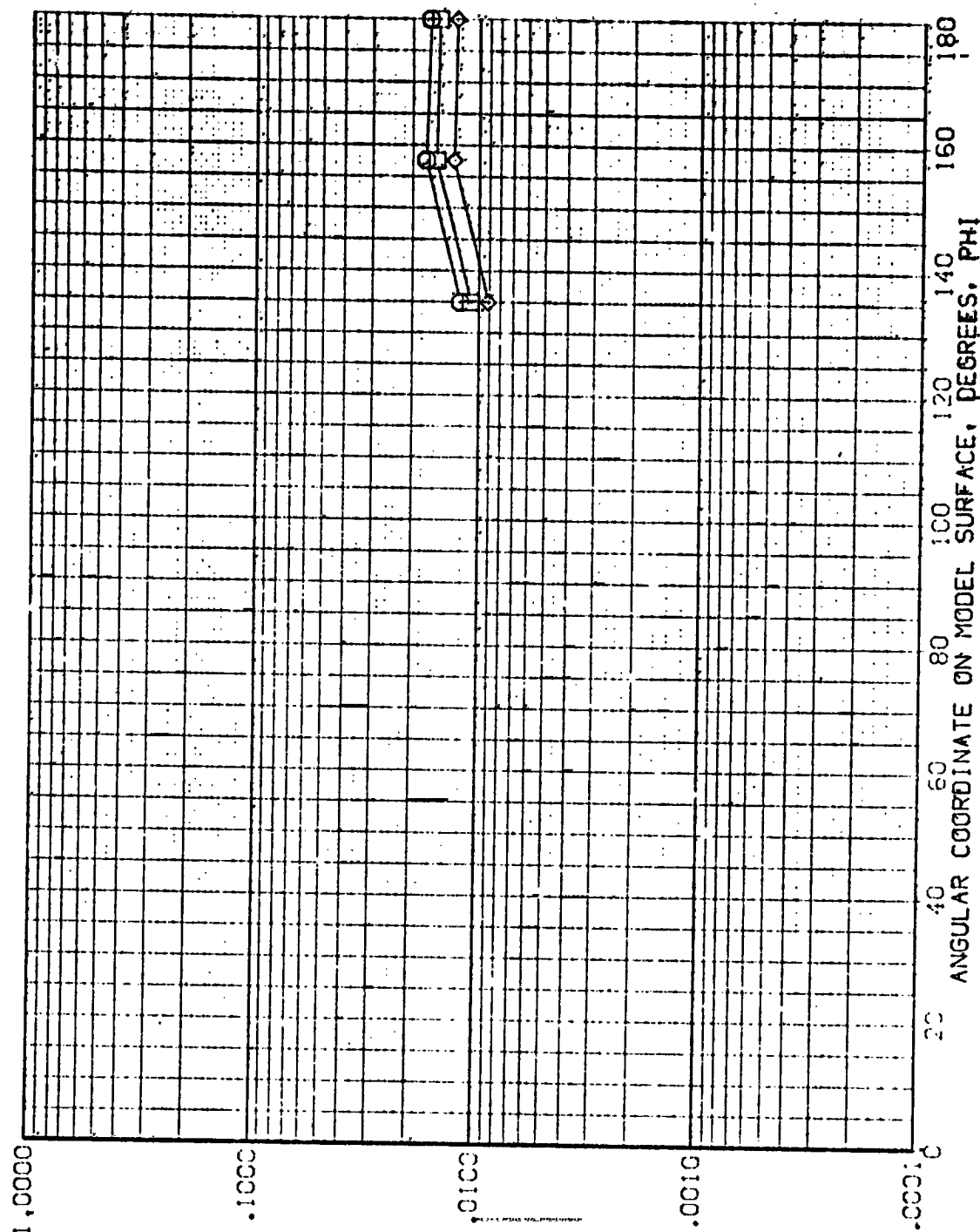


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

(REV111)

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

SYMBOL

HA<sub>0</sub>/H<sub>T</sub>  
.850  
.900  
1.000

K/L .900

MACH 5.330

PARAMETRIC VALUES  
ALPHA 30.000  
RN/L 4.000  
BETA .800

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

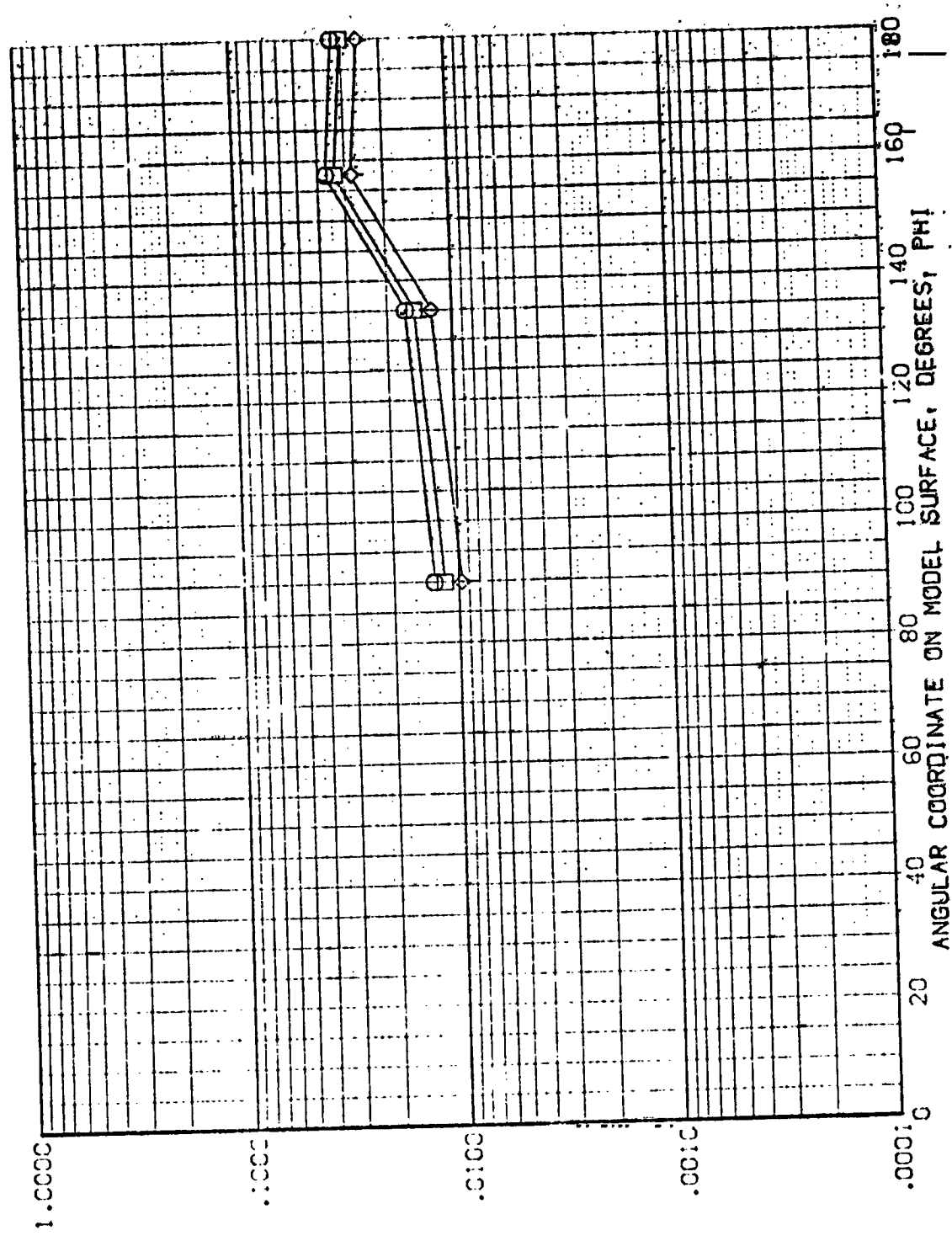


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T. EXTERNAL TANK

(REV111)

SYMBOL

1.000  
.850  
.650

X/L .850  
MACH 5.300

PARAMETRIC VALUES  
ALPHA 30.000  
RN/L 14.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

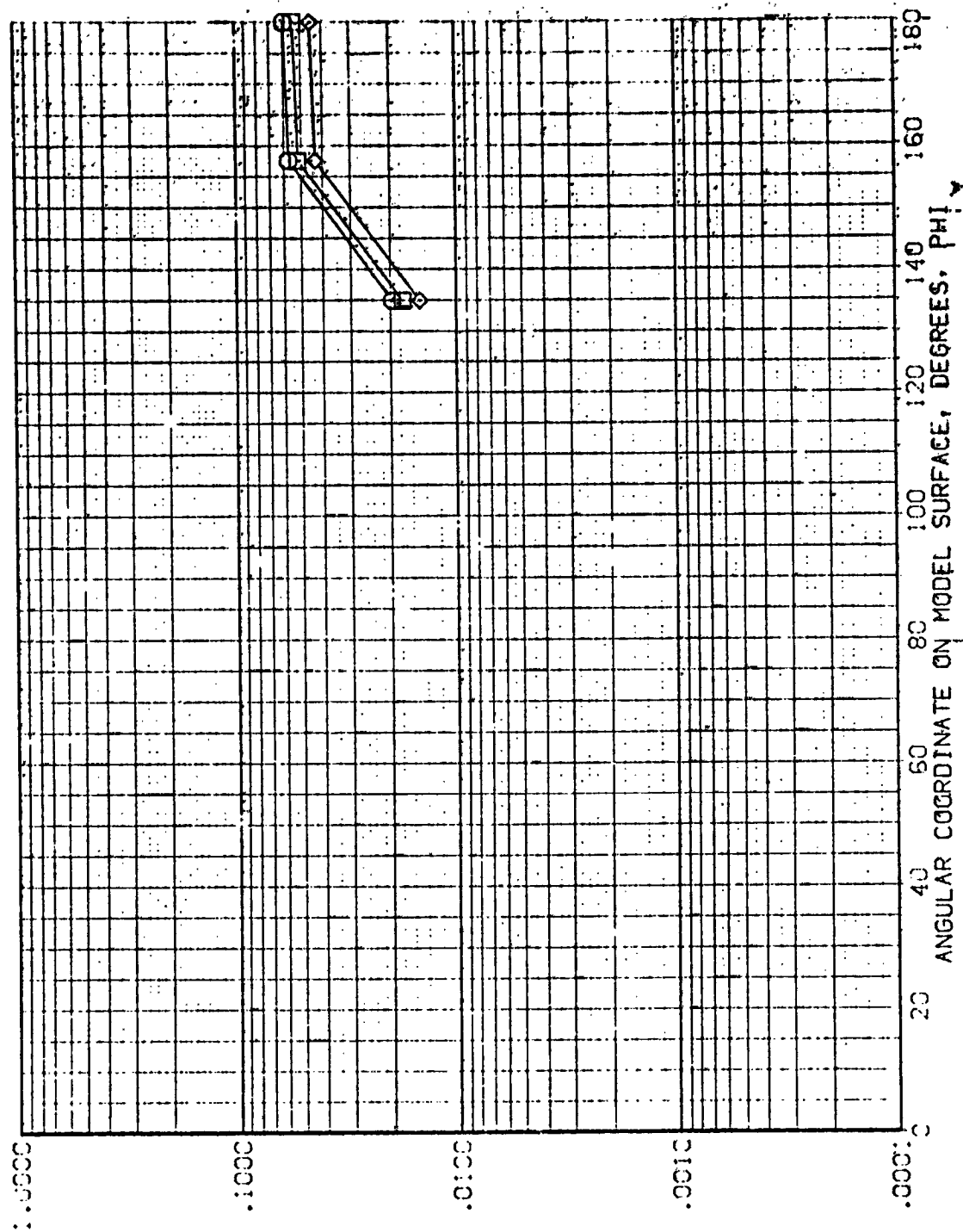


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

SYMBOL  
 ◇  
 □  
 ○

W/HT X/L MACH  
 .850 .900 5.300  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000 BETA .000  
 RN/L 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

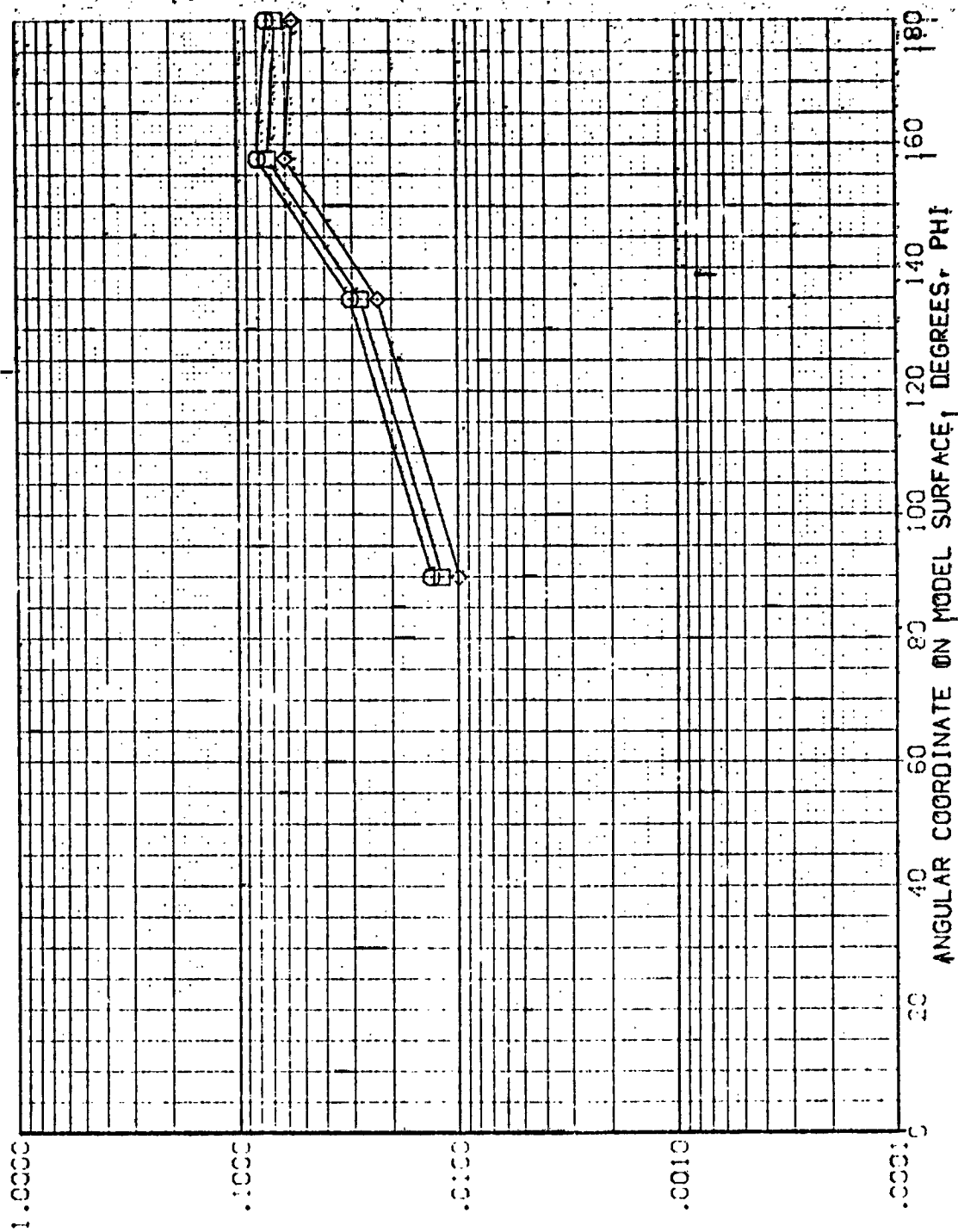


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AYES 3.5-195 1H28 01+T1 EXTERNAL TANK

(REV T12)

SYMBOL HAW/HT Y/L MACH  
 ◇ □ .850 .350 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000  
 RV/L 1.000  
 BETA 15.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

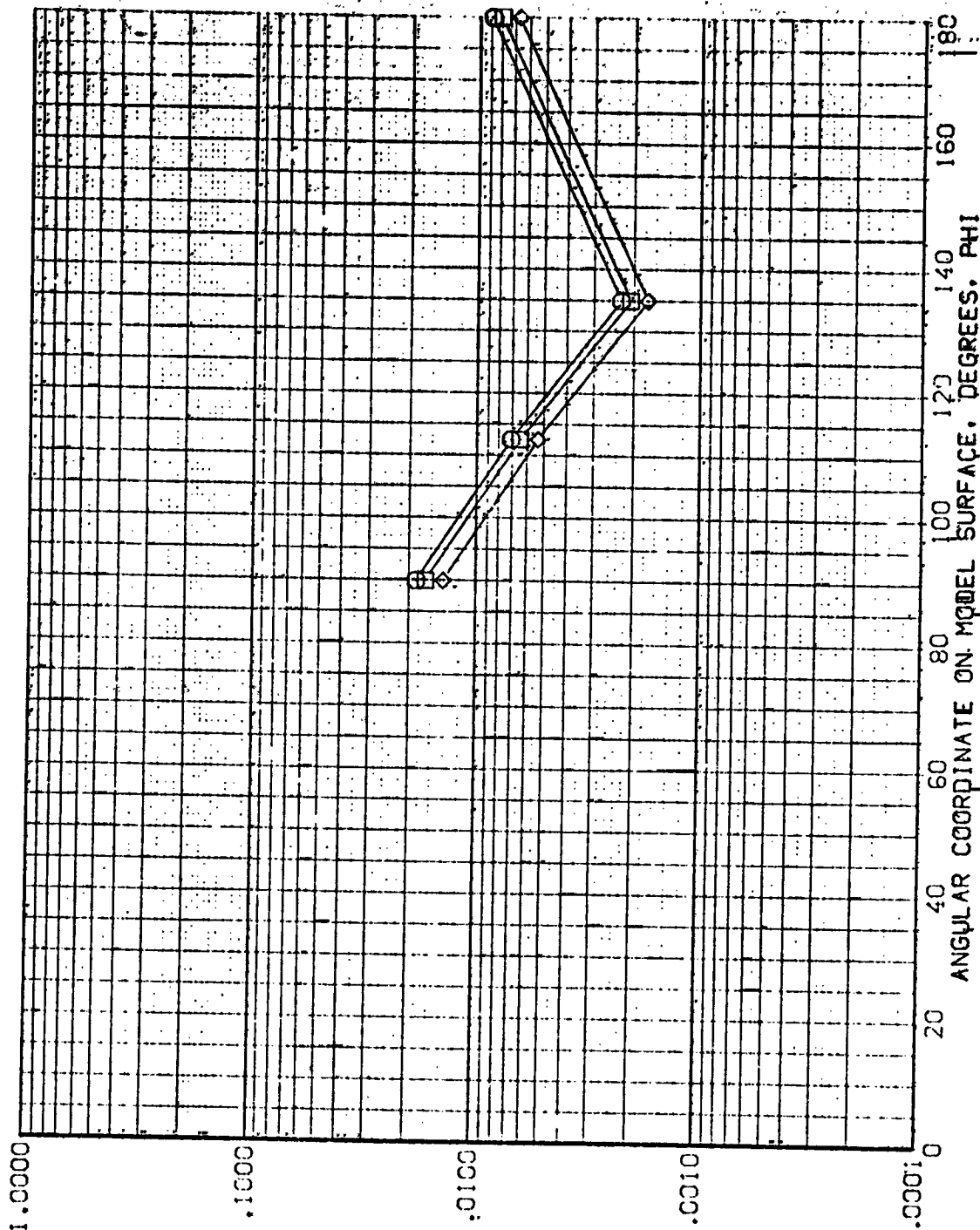


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

# AMES 3.5-195 IH28 C1+T1 EXTERNAL TANK

(REV112)

SYNOPSIS  
 H<sub>2</sub>/H<sub>2</sub> .850  
 X/L .400  
 MACH 5.219  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

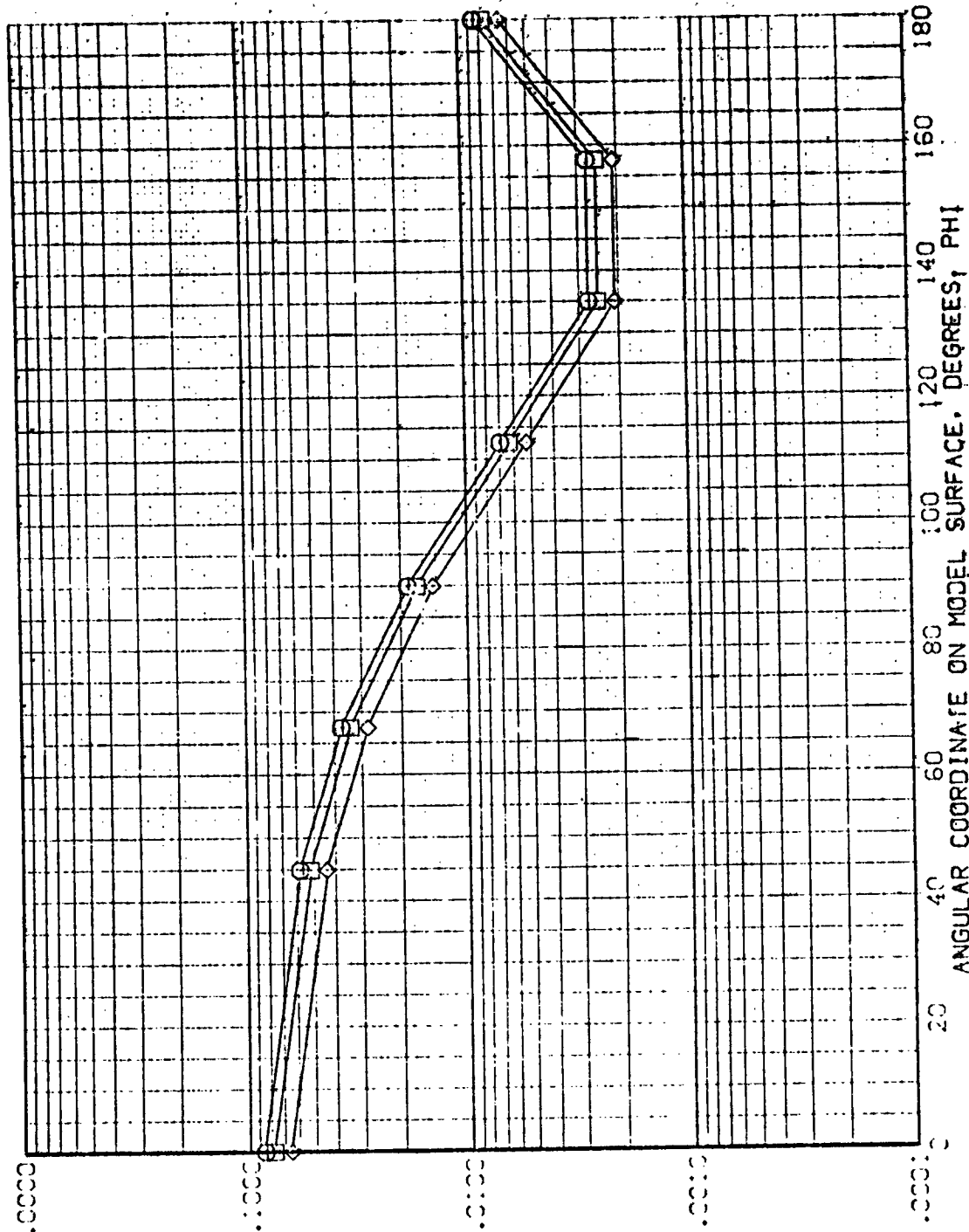


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1H28 C1+T1 EXTERNAL TANK

(REV112)

SVRSC - .350  
Y/L .450  
MACH 5.219

PARAMETRIC VALUES  
ALPHA 30.000  
RN/L 1.000  
BETA -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

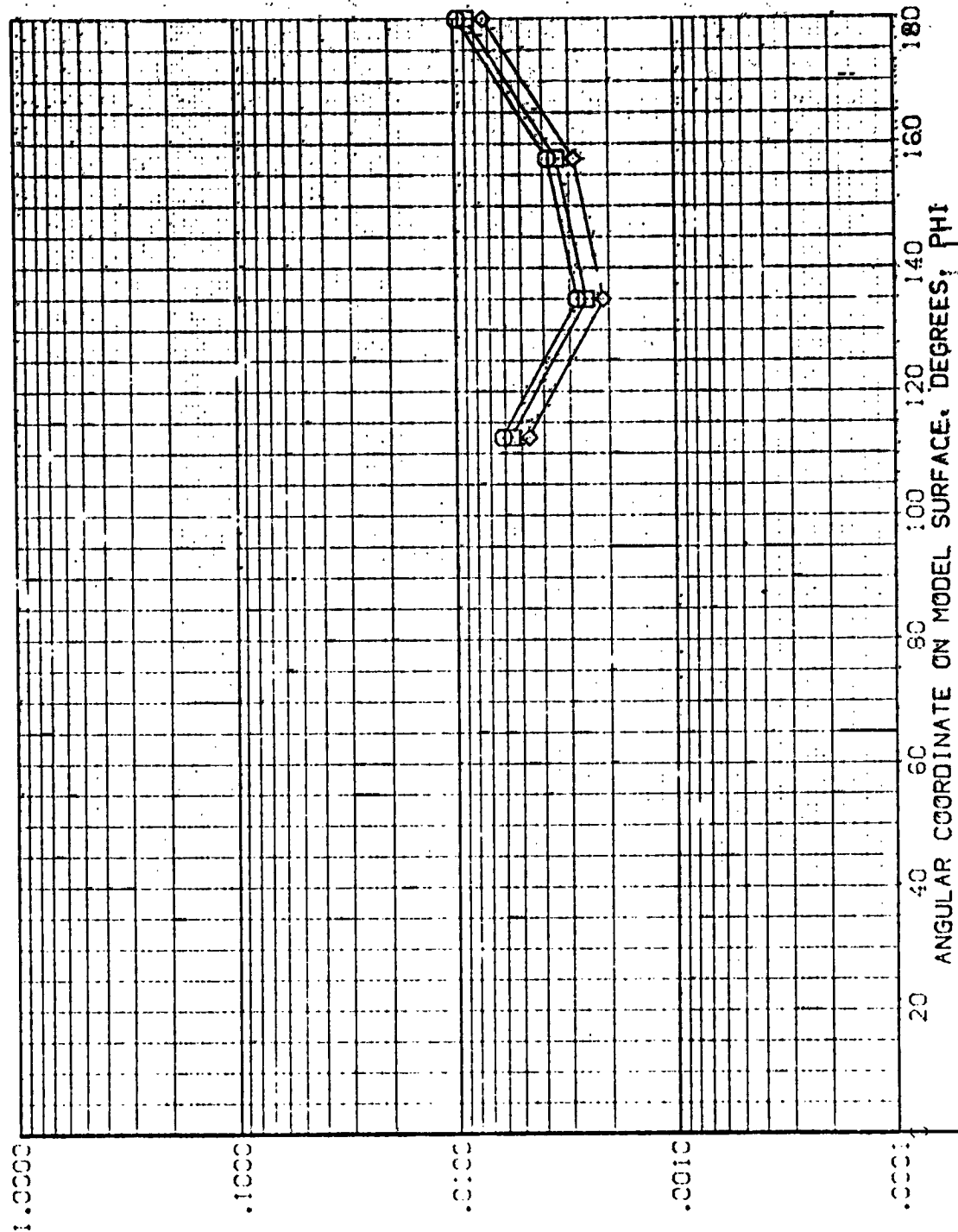


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



SYMBOLS  
 ◇ □ ○

WALL K/L MACH  
 .350 .500 5.219  
 .600  
 1.000

PARAMETRIC VALUES  
 ALPHA 30 300 BETA -5.000  
 R1/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

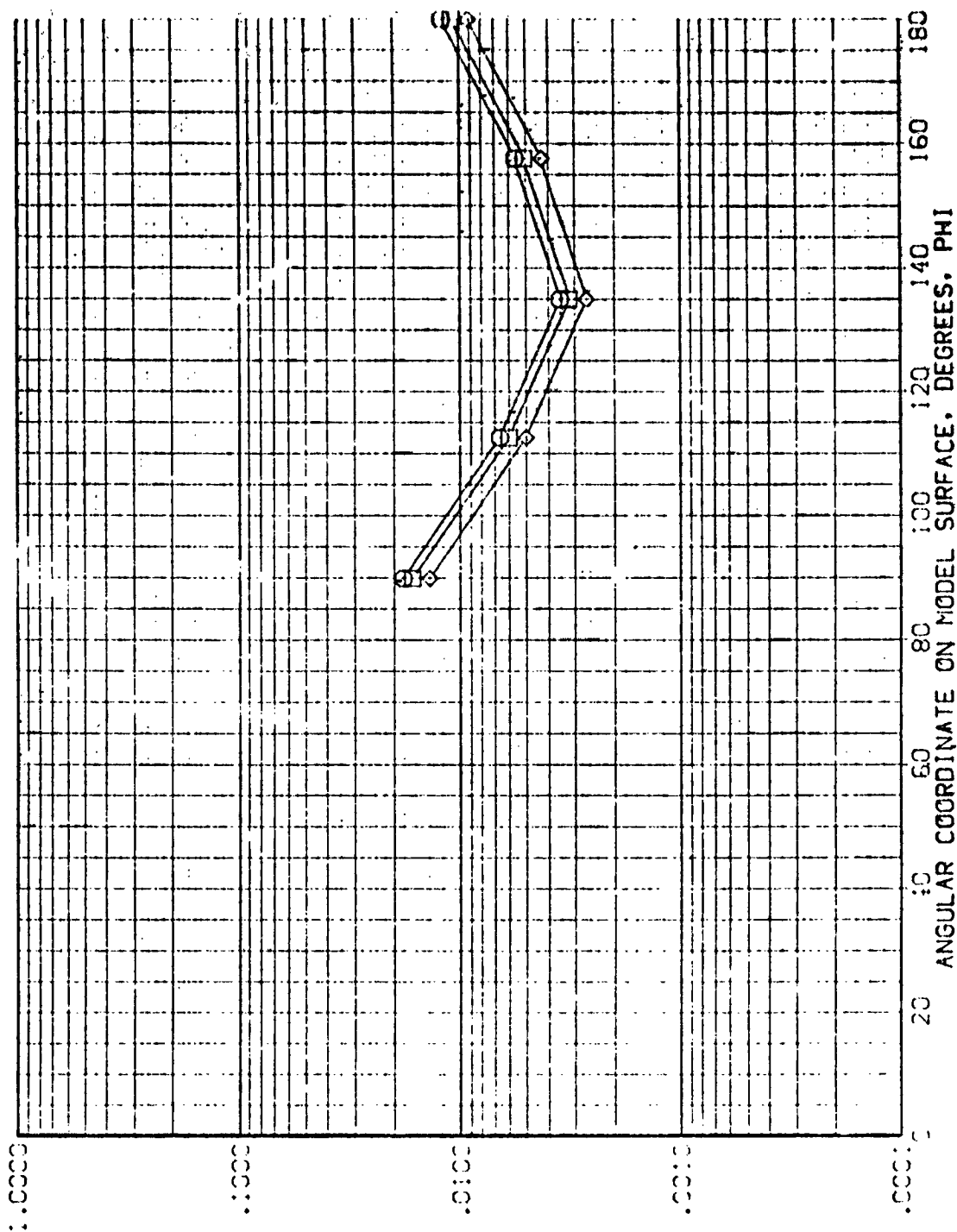


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01-11 EXTERNAL TANK (REV12)

PARAMETRIC VALUES  
 ALPHA 39.000  
 BETA 1.000  
 R/V/L -5.000

WACH 5.219  
 P/L .550  
 H/HREF .500  
 S/HREF 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

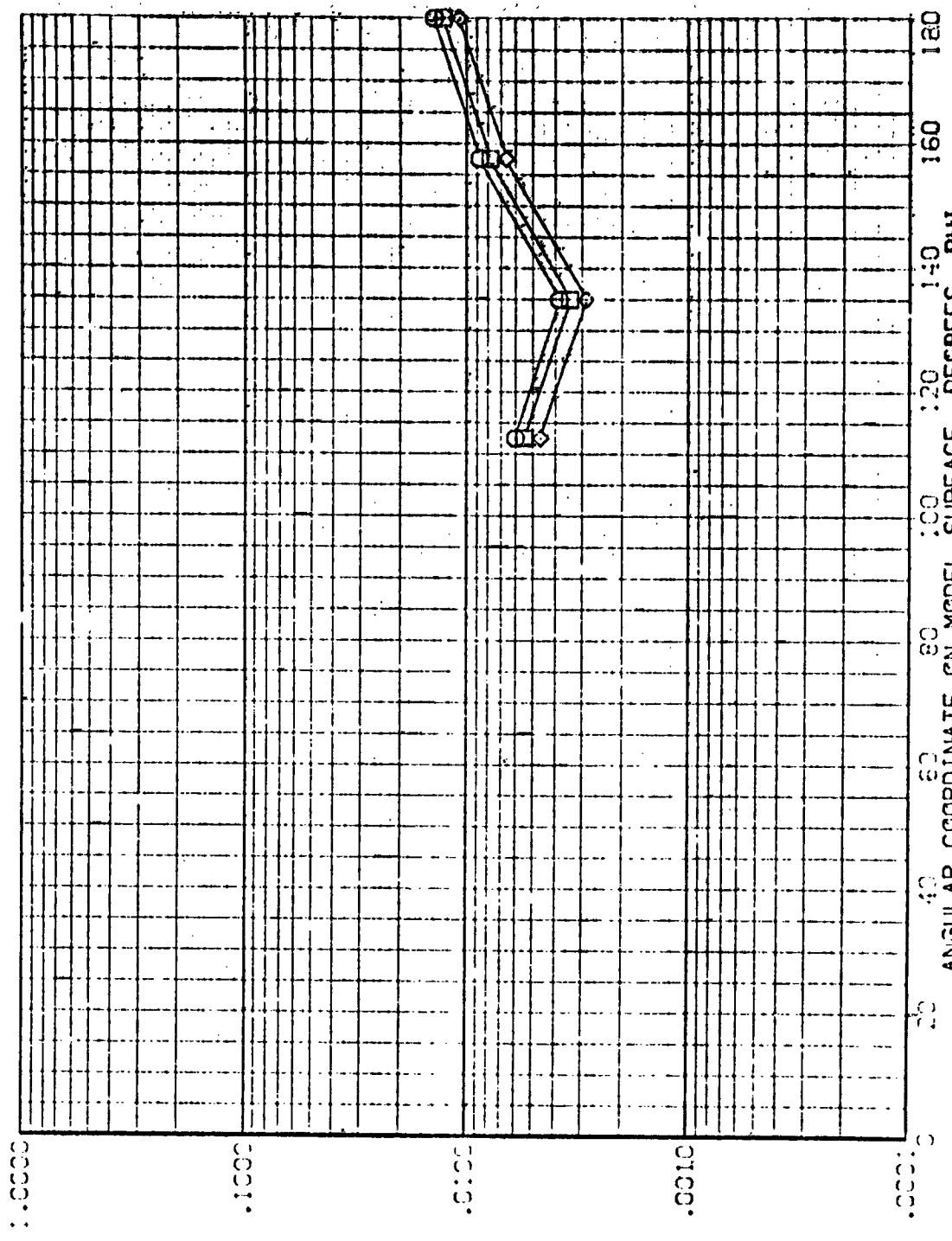


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV12)

SYNOPSIS  
 WAVELENGTH 5.219  
 WAVELENGTH 5.219  
 WAVELENGTH 5.219  
 WAVELENGTH 5.219

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 RAY/L -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

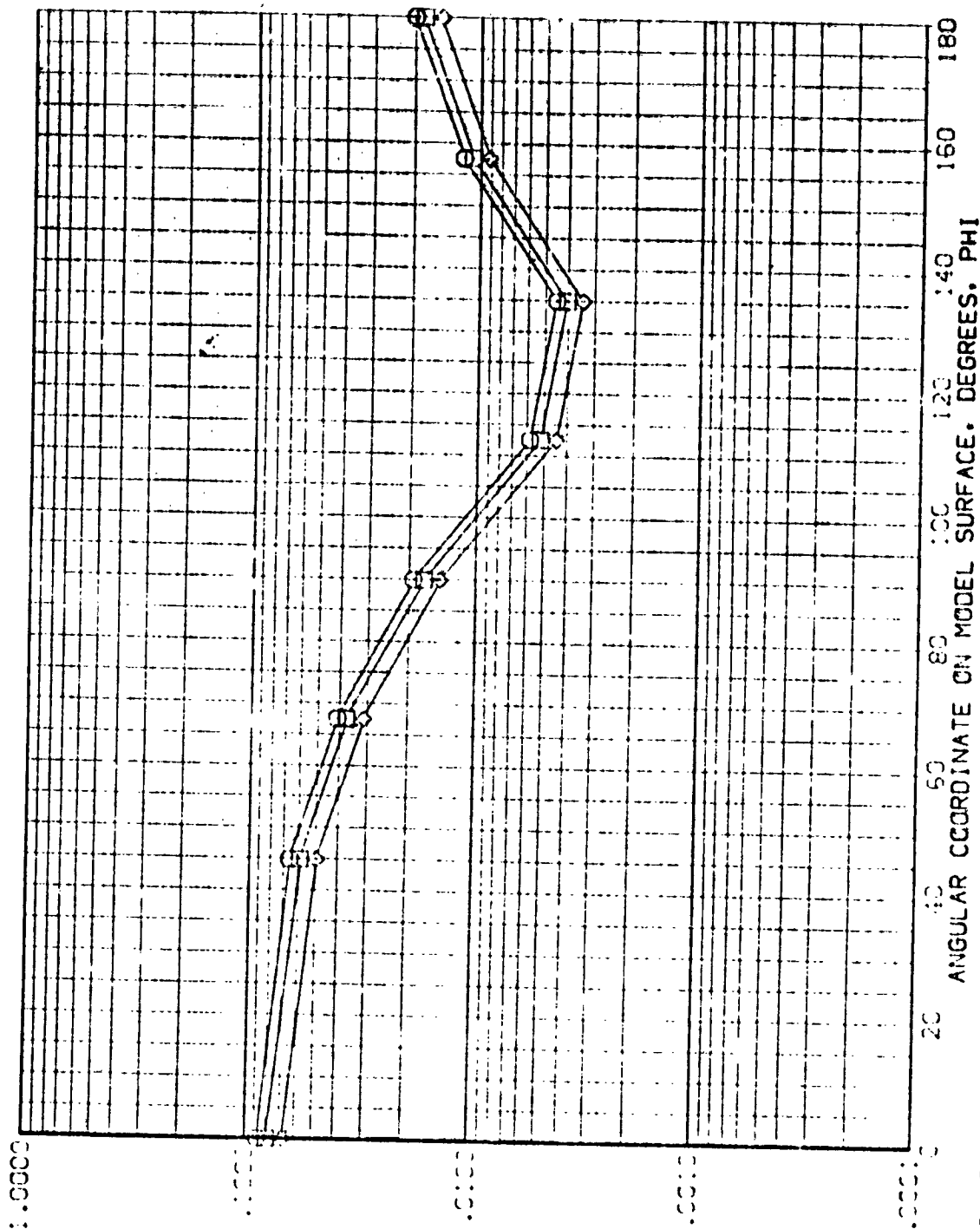


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AMES 3.5-195 1R28 01+T1 EXTERNAL TANK

(REV112)

SAVED-  
 HEIGHT  
 1800  
 1600  
 1400  
 1200  
 1000  
 800  
 600  
 400  
 200  
 0

V  
 1600  
 1400  
 1200  
 1000  
 800  
 600  
 400  
 200  
 0

PARAMETRIC VALUES  
 ALPHA  
 30.000  
 BETA  
 1.000  
 -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

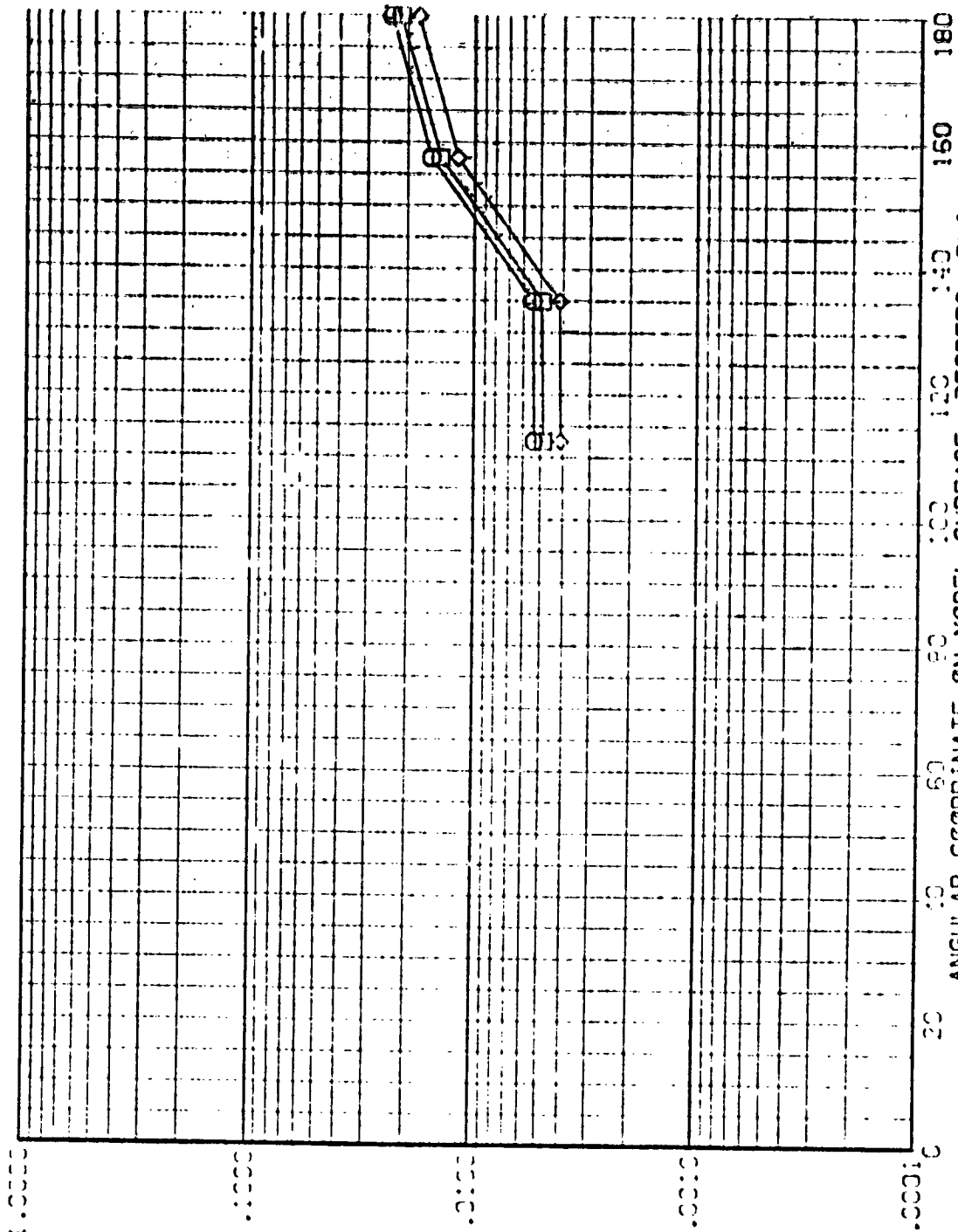


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

AVES 3.5-195 1428 01+11 EXTERNAL TANK

(REVT12)

OVER-  
DITOL  
1.000  
1.000  
1.000  
1.000

WACH  
1.000 5.219

GEOMETRIC VALUES  
ALPHA 30.000  
BETA 1.000  
-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

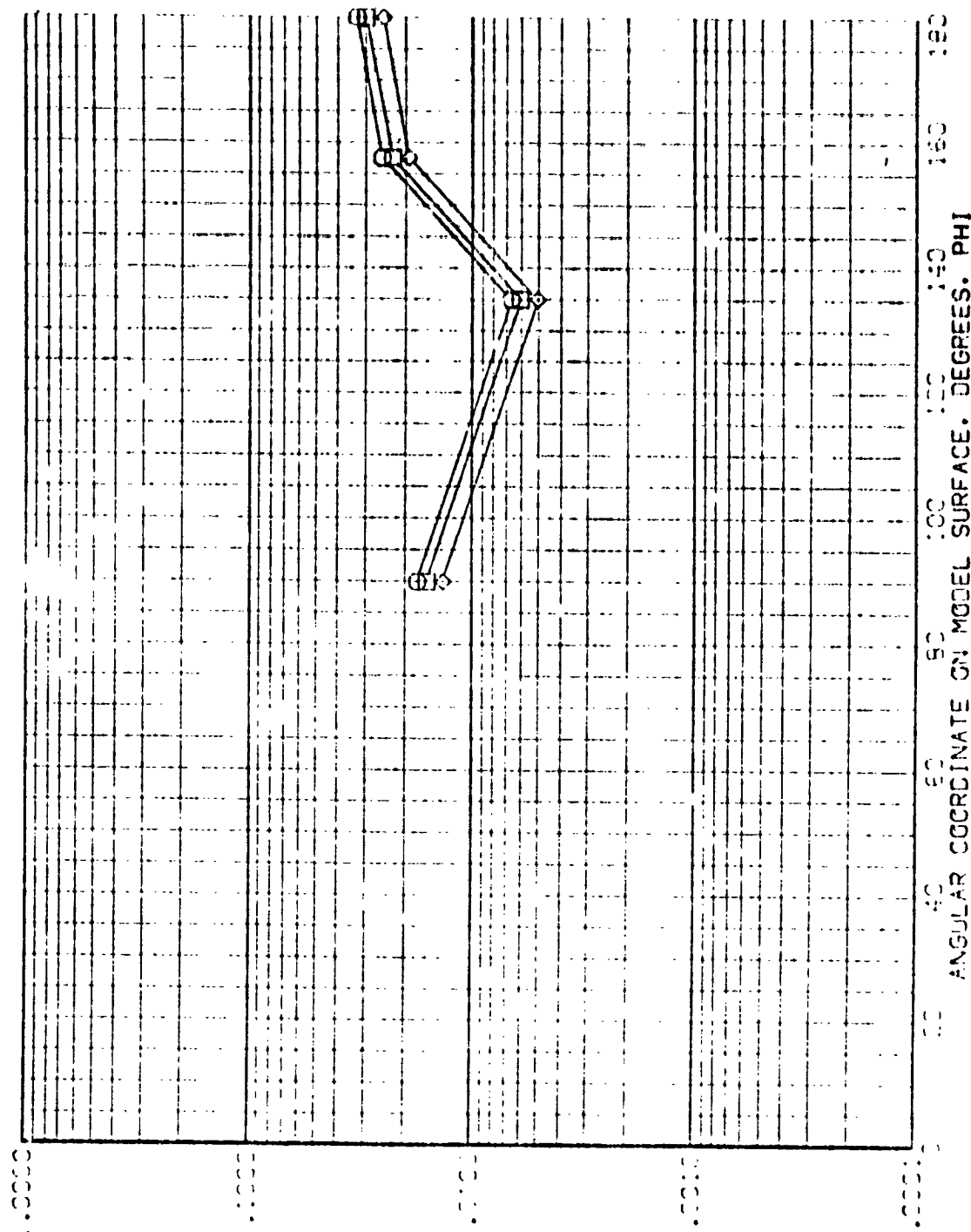


FIG. 5 TANK IN THE PRESENCE OF ORBITER

FIG. 5 TANK IN THE PRESENCE OF ORBITER

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 -S.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

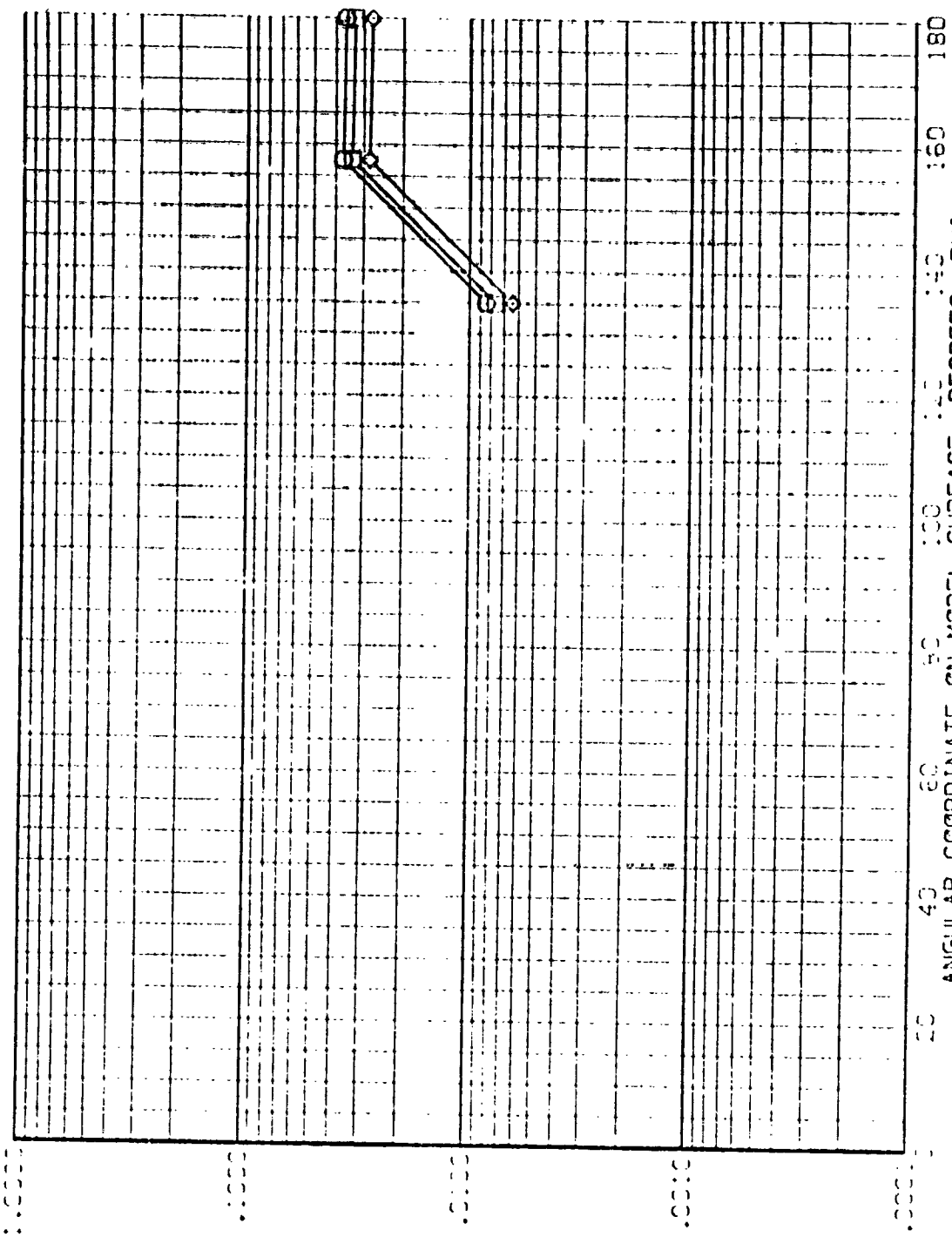


FIG. 5 TANK IN THE PRESENCE OF ORBITER

AMES 3.5-195 IH28 01+T1 EXTERNAL TANI.

(REVT12)

SYMBOL

HAIRY  
1.500  
1.300  
1.000

X/L  
.800

MACH  
5.219

PARAMETRIC VALUES

ALPHA  
RNAL  
30.000  
1.000  
BETA  
-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

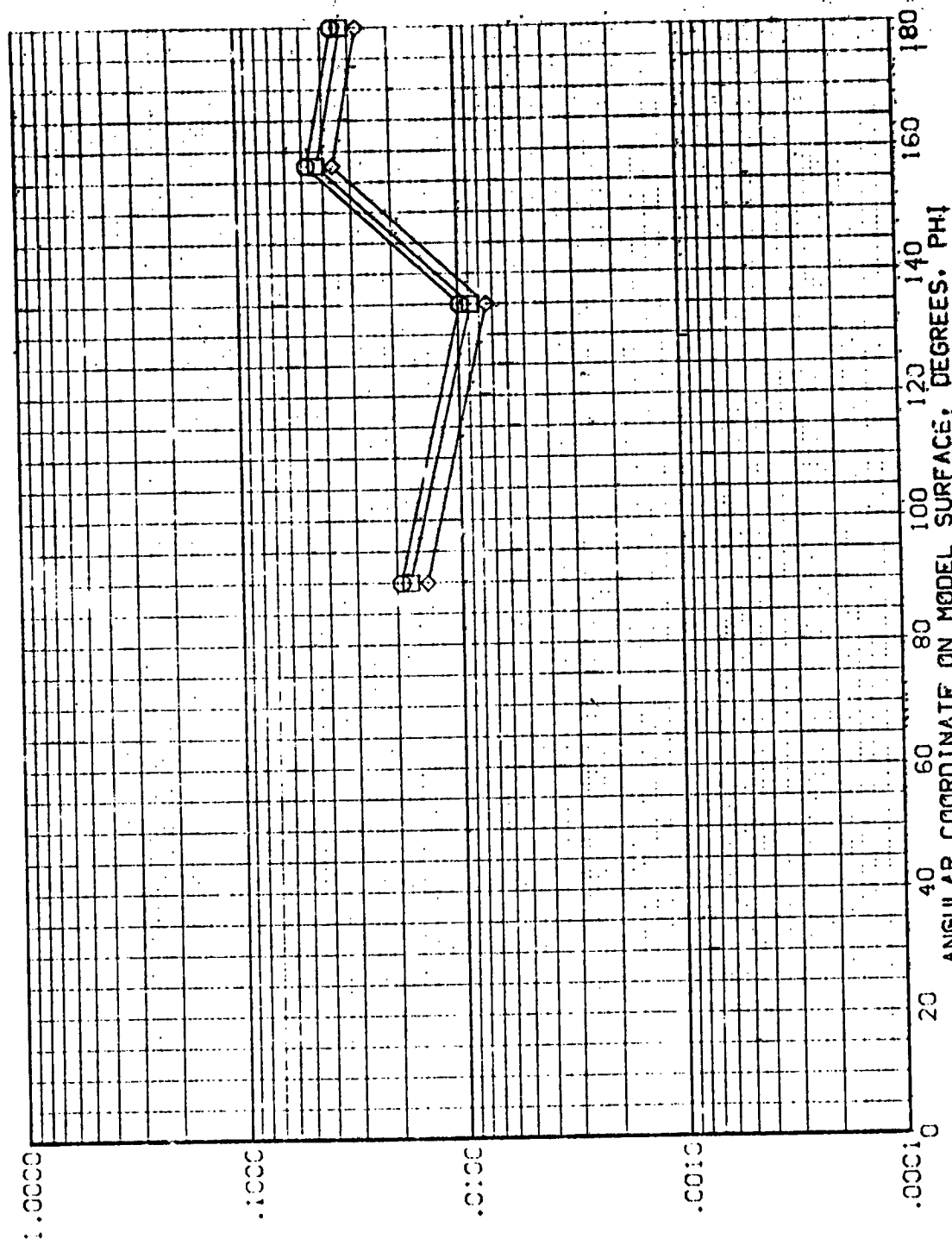


FIG. 5 TANK, IN THE PRESENCE OF QUARTER

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DOCUMENT IS PROHIBITED

(REV 12)

SYNOPSIS	DATE	PAGE	WACH
○	.850	.850	5.219
□	.850		
◇	.600		

PARAMETRIC VALUES	
ALPHA	30.000
BETA	1.000
RN/L	5.000

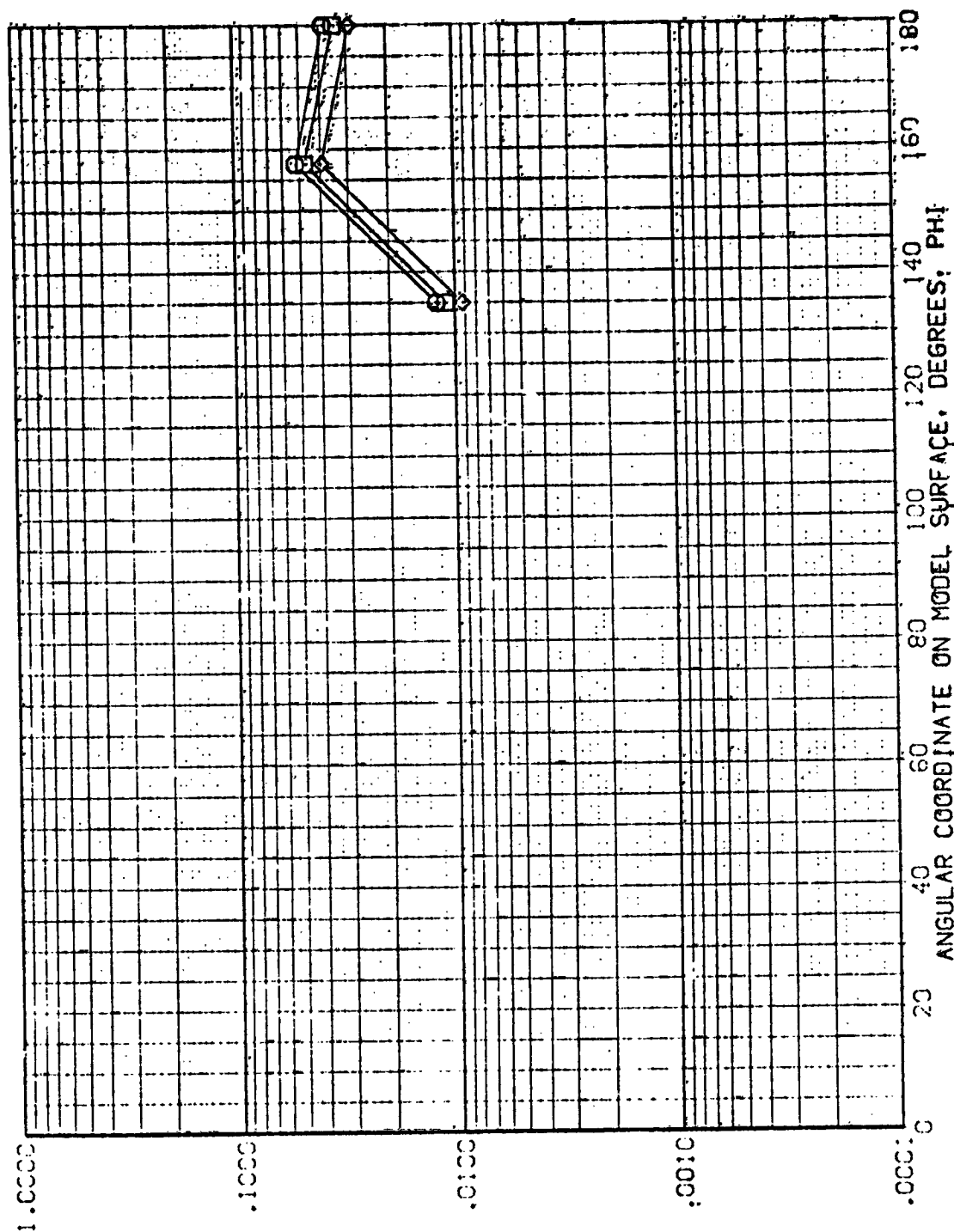
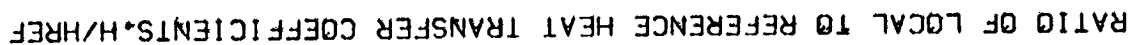


FIG. 5 TANK, IN THE PRESENCE OF ORBITER



# AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV12)

SYMBOL MAX/HT X/L MACH

.85C .900 5.219  
.900  
1.000

ALPHA  
RN/L

PARAMETRIC VALUES  
30.000 BETA  
1.000 -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

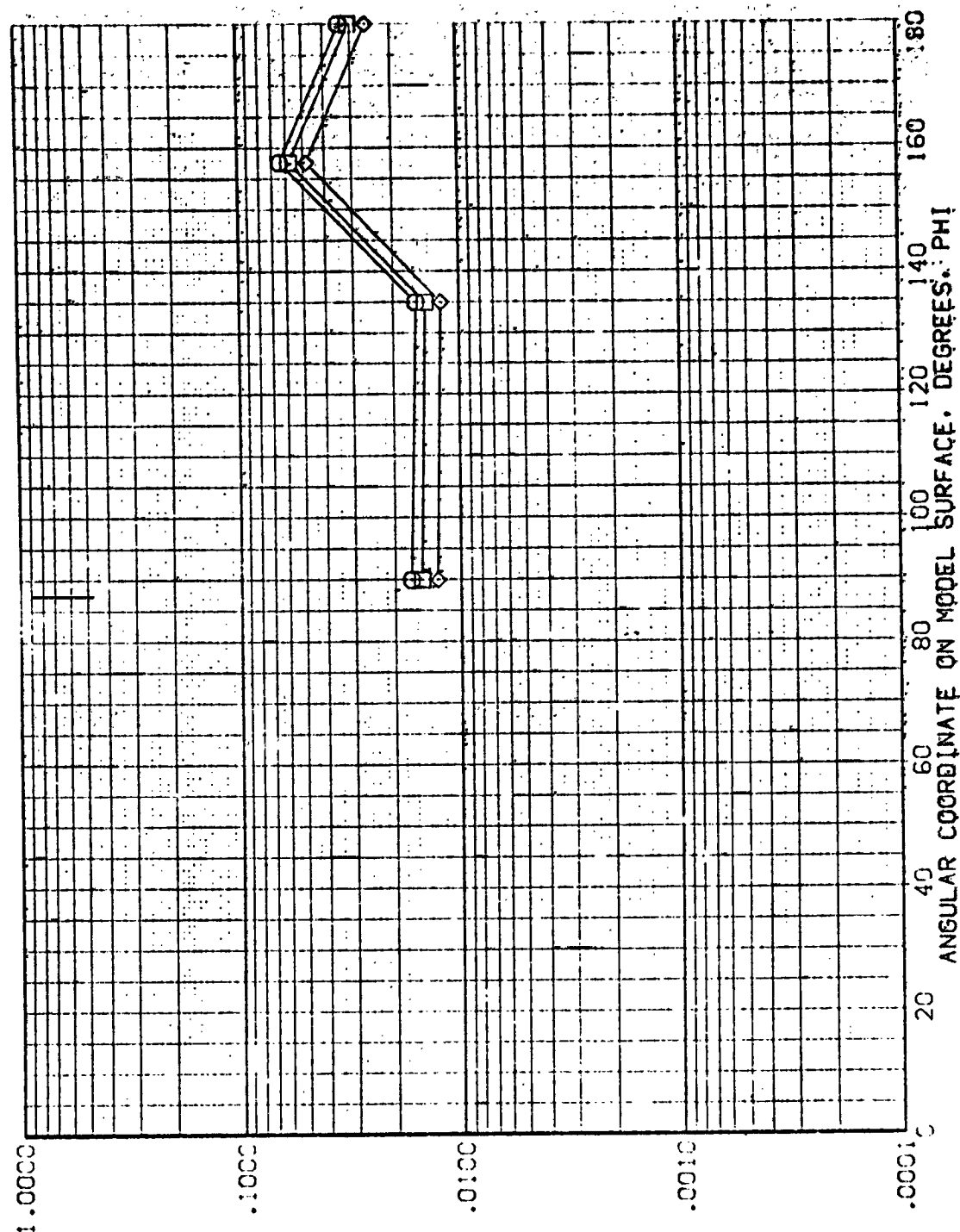


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

ALPHA	BETA	RN/L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

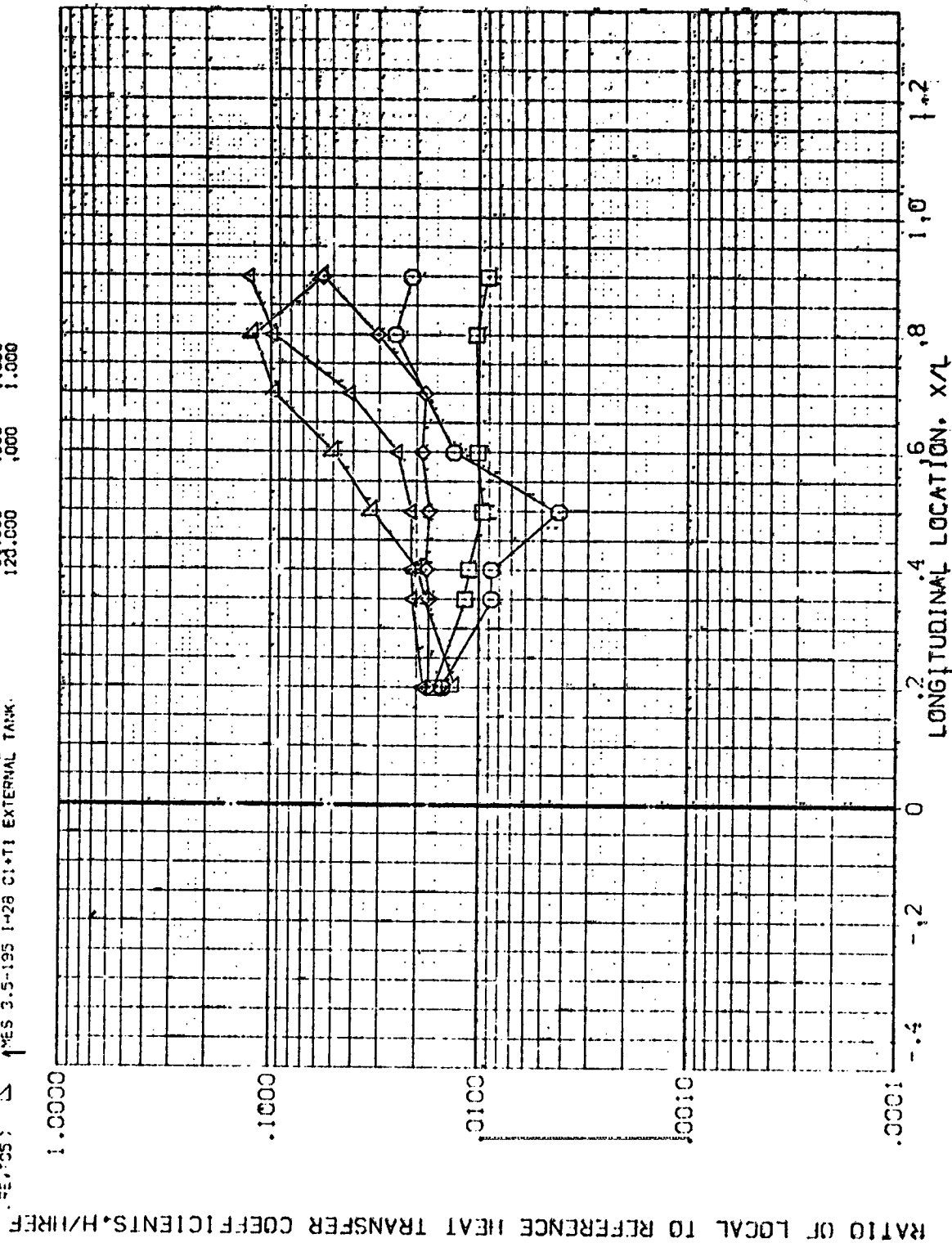


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$$\begin{aligned} \text{WACC} &= 5.33\% \times 44\% / 47\% = 4.90\% \end{aligned}$$

DATA SET SAVED  
 (00101)  
 (00102)  
 (00103)  
 (00104)  
 (00105)

CONFIGURATION DESCRIPTION  
 1428 3.5-195 EXTERNAL TANK  
 1428 3.5-195 EXTERNAL TANK  
 1428 3.5-195 EXTERNAL TANK  
 1428 3.5-195 EXTERNAL TANK  
 1428 3.5-195 EXTERNAL TANK

ALPHA BETA  $\gamma/V_L$   
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

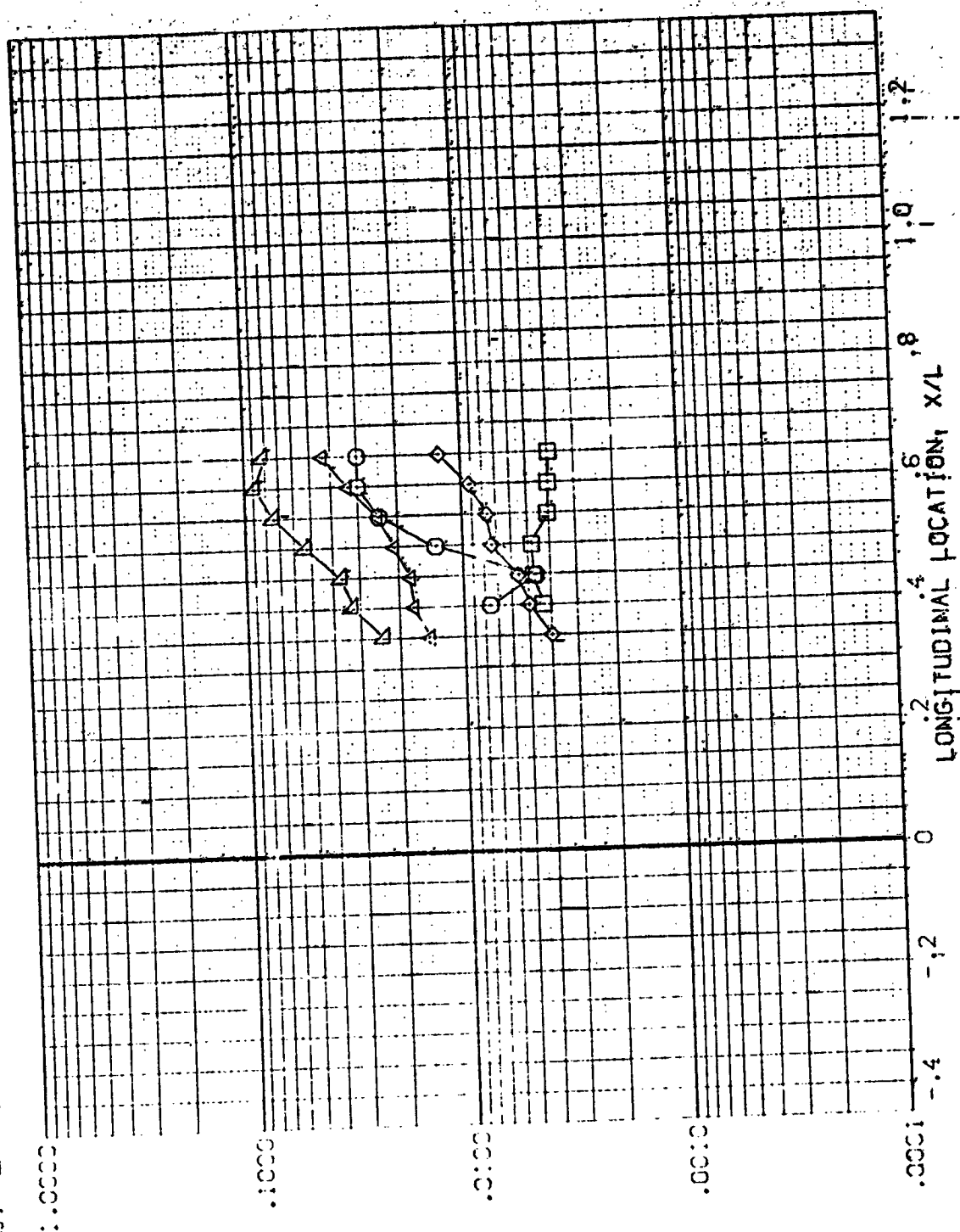


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

MACH = 5.300 HAW/HT = .900 PHI = 112,500

DATA SET SYMBOL  
(REV101)  
(REV102)  
(REV103)  
(REV104)  
(REV105)

CONFIGURATION DESCRIPTION  
AVES 3.5:195 (H28 C1+T1) EXTERNAL TANK  
AVES 3.5:195 (H28 C1+T1) EXTERNAL TANK  
AVES 3.5:195 (H28 C1+T1) EXTERNAL TANK  
AVES 3.5:195 (H28 C1+T1) EXTERNAL TANK  
AVES 3.5:195 (H28 C1+T1) EXTERNAL TANK

ALPHA BETA RNT/  
.000 .000  
20.000 .000  
60.000 .000  
90.000 .000  
120.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

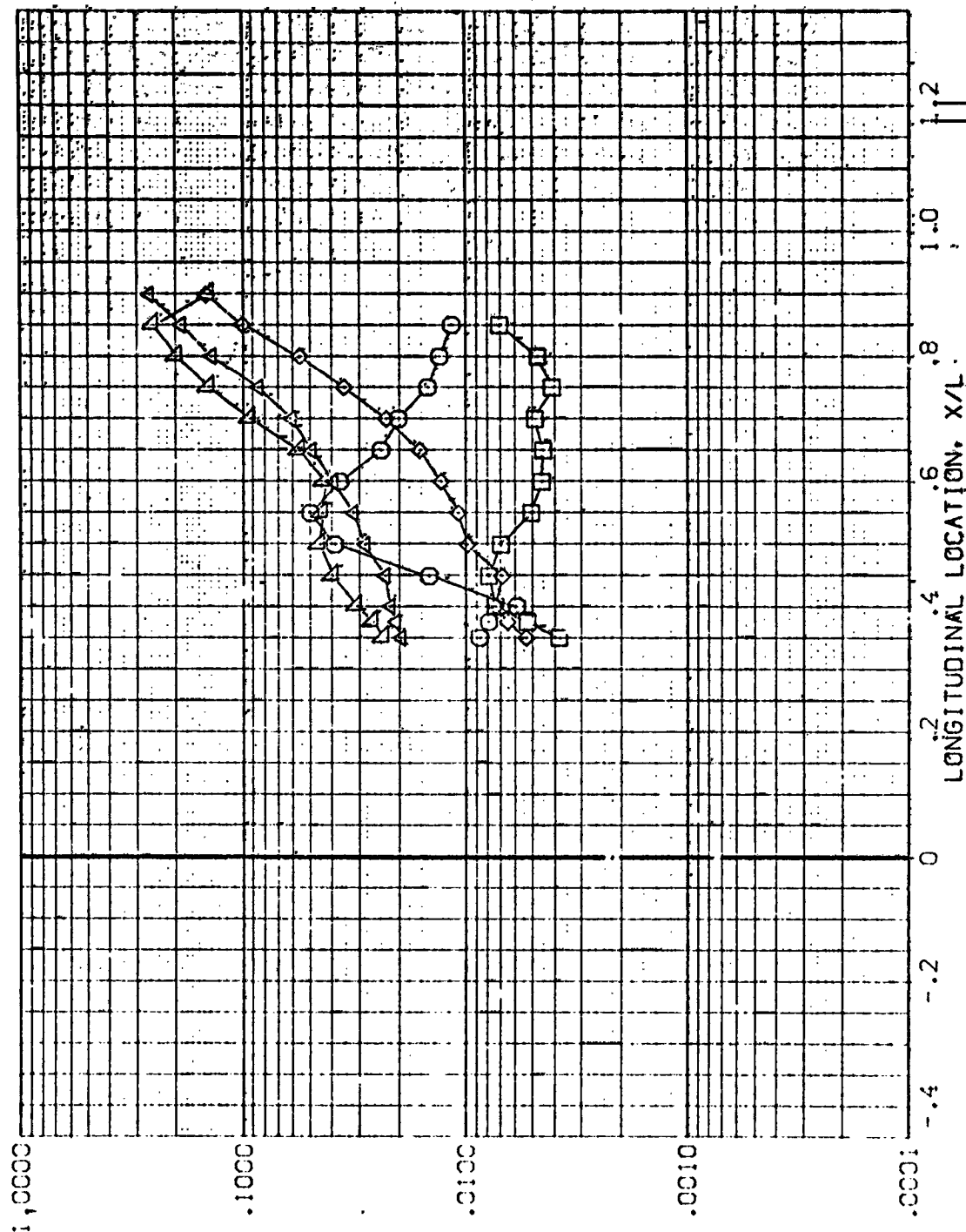


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

MACH = 5.300 HAW/HT = .900 PHI = 135.000

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (REV01) AMS 3.5-195 1428 01\*11 EXTERNAL TANK  
 (REV02) AMS 3.5-195 1428 01\*11 EXTERNAL TANK  
 (REV03) AMS 3.5-195 1428 01\*11 EXTERNAL TANK  
 (REV04) AMS 3.5-195 1428 01\*11 EXTERNAL TANK  
 (REV05) AMS 3.5-195 1428 01\*11 EXTERNAL TANK

ALPHA BETA RN/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

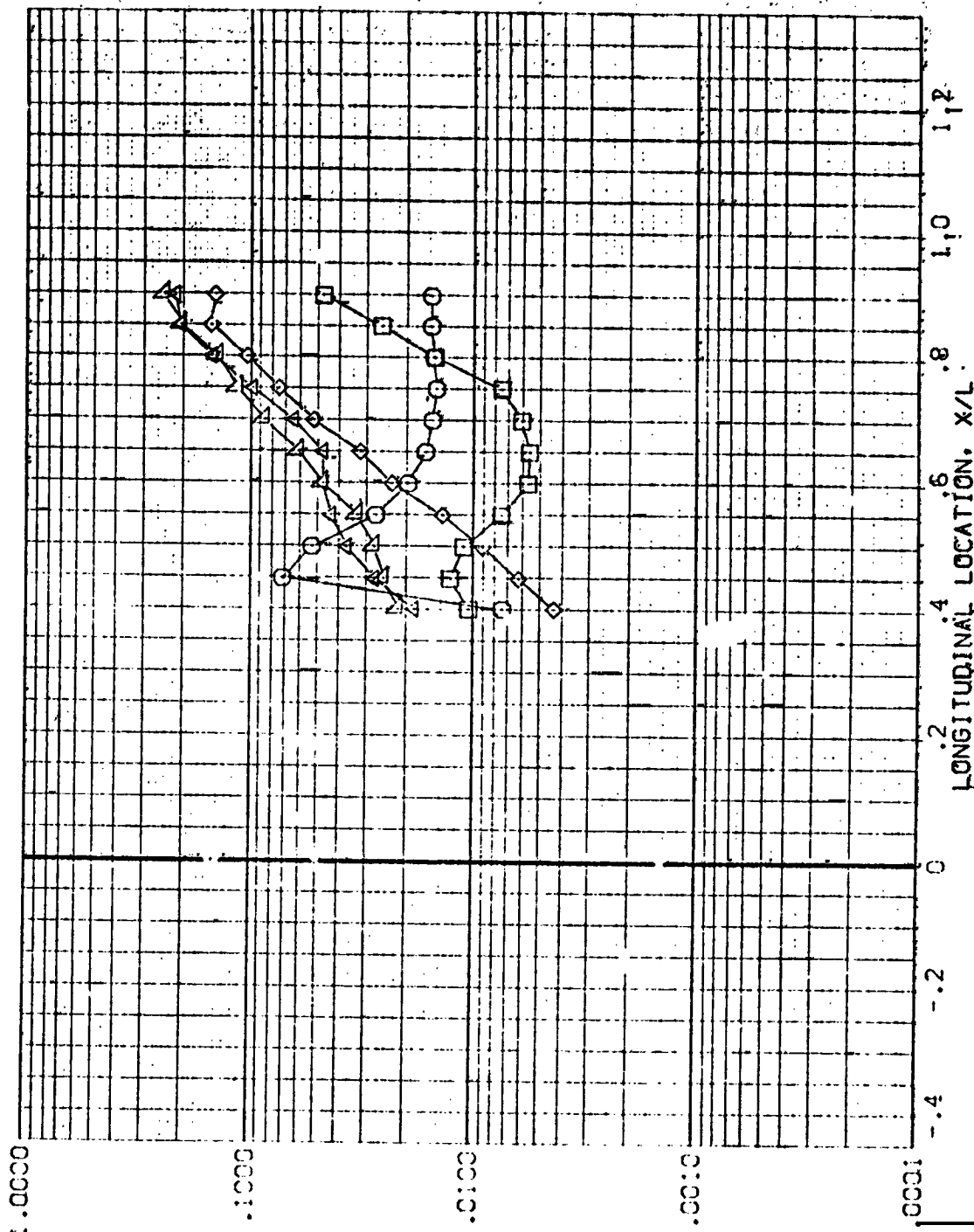


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$\gamma = 5.300$   $\mu = 0.900$   $\phi = 157.500$

DATA SET	SVN	DESCRIPTION	ALPHA	BETA	RV/L
1	000000	EXTERNAL TANK	.000	.000	1.000
2	000000	EXTERNAL TANK	.30000	.000	1.000
3	000000	EXTERNAL TANK	.60000	.000	1.000
4	000000	EXTERNAL TANK	.90000	.000	1.000
5	000000	EXTERNAL TANK	1.20000	.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

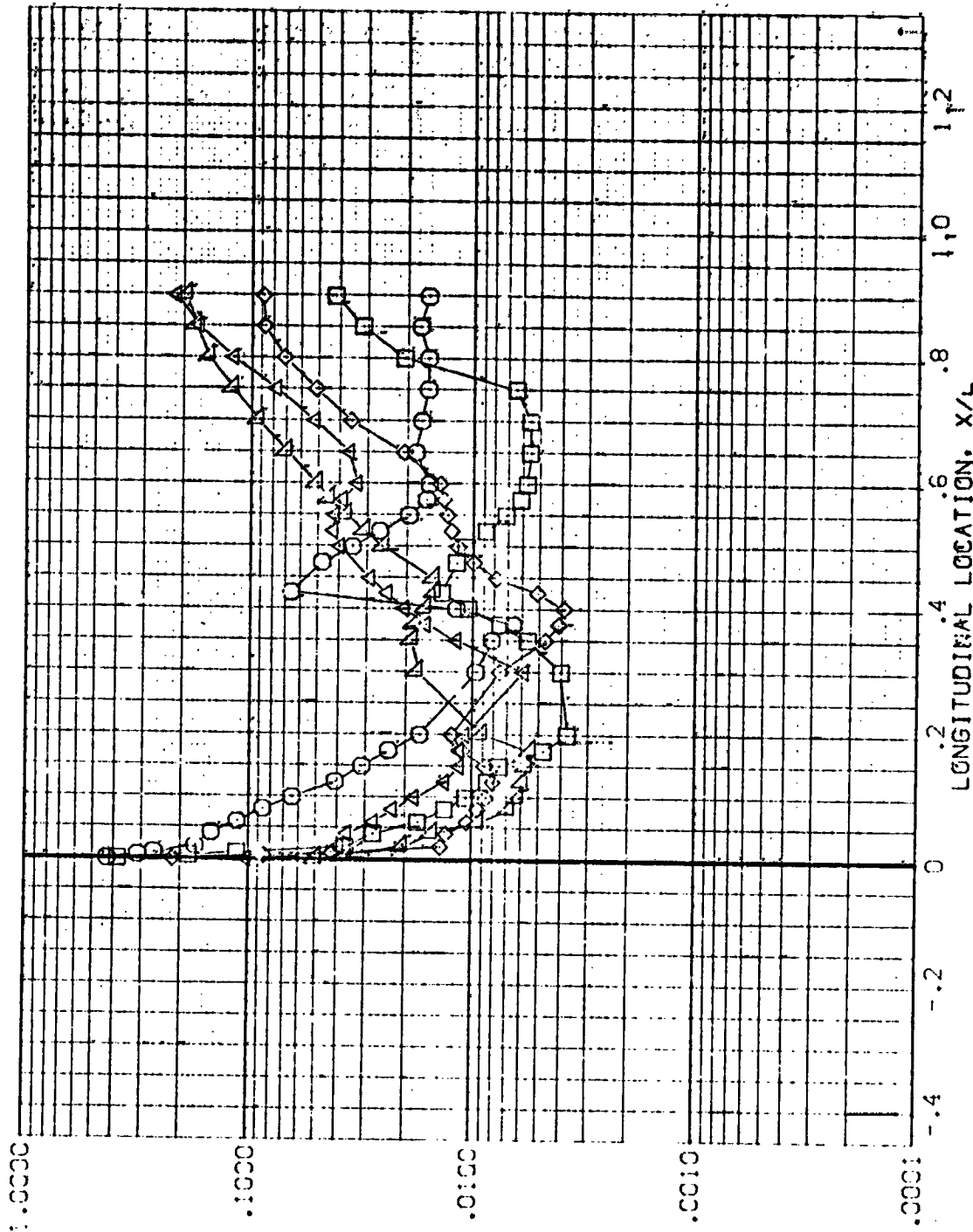


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$\nu/\mu = 5.300$   $\mu/\nu/\mu = .900$   $\phi = 180.000$

$\frac{h}{h_{REF}}$  RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

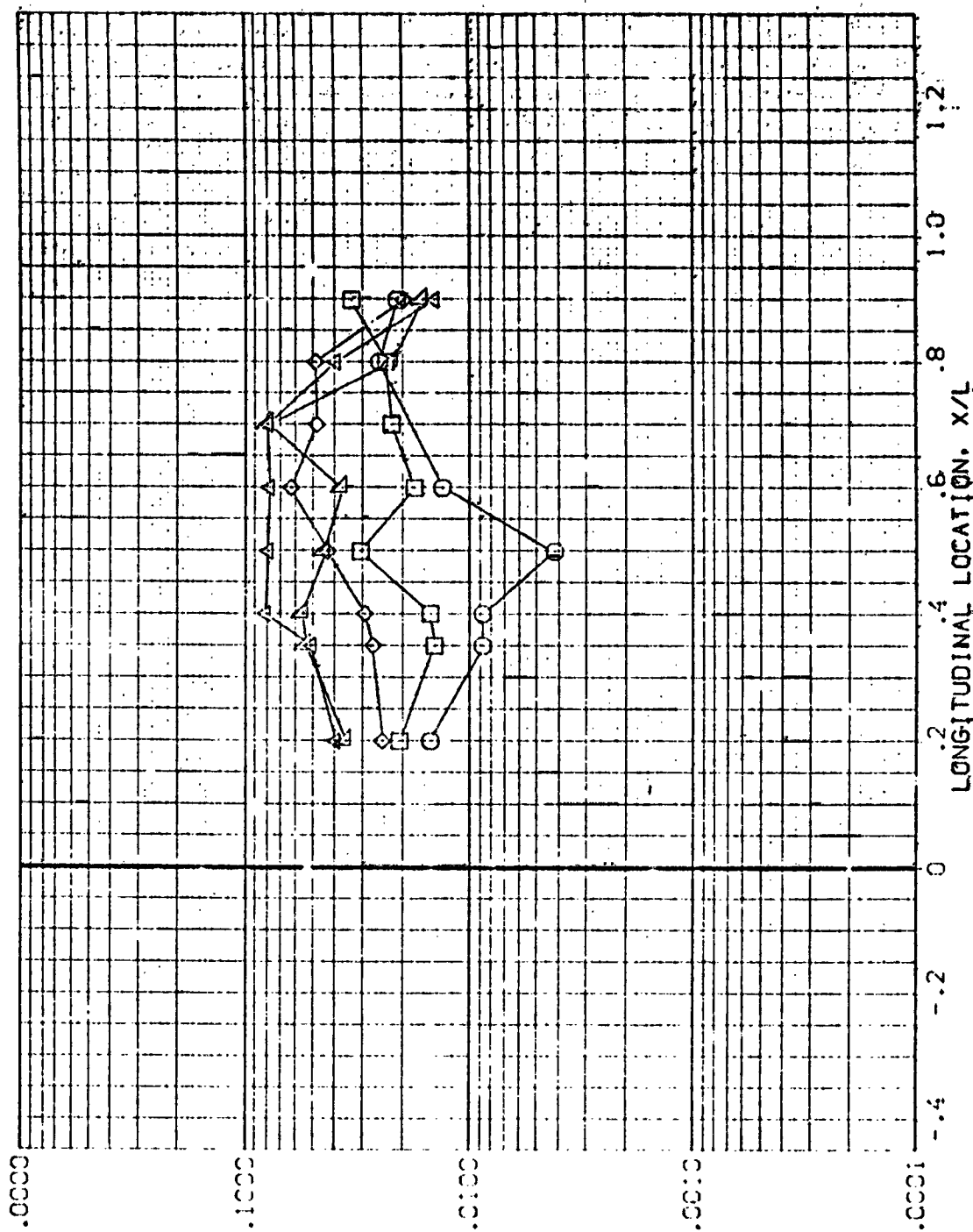
[illegible]

FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$$\frac{14W}{H} = 5.33 \quad \text{and} \quad \frac{14W}{H} = 50.000$$

PAGE. 322

SECRET

ALPHA	BETA	RV/L
1.000	.000	1.000
-50.000	.000	1.000
-50.000	.000	1.000
-50.000	.000	1.000
-120.000	.000	1.000

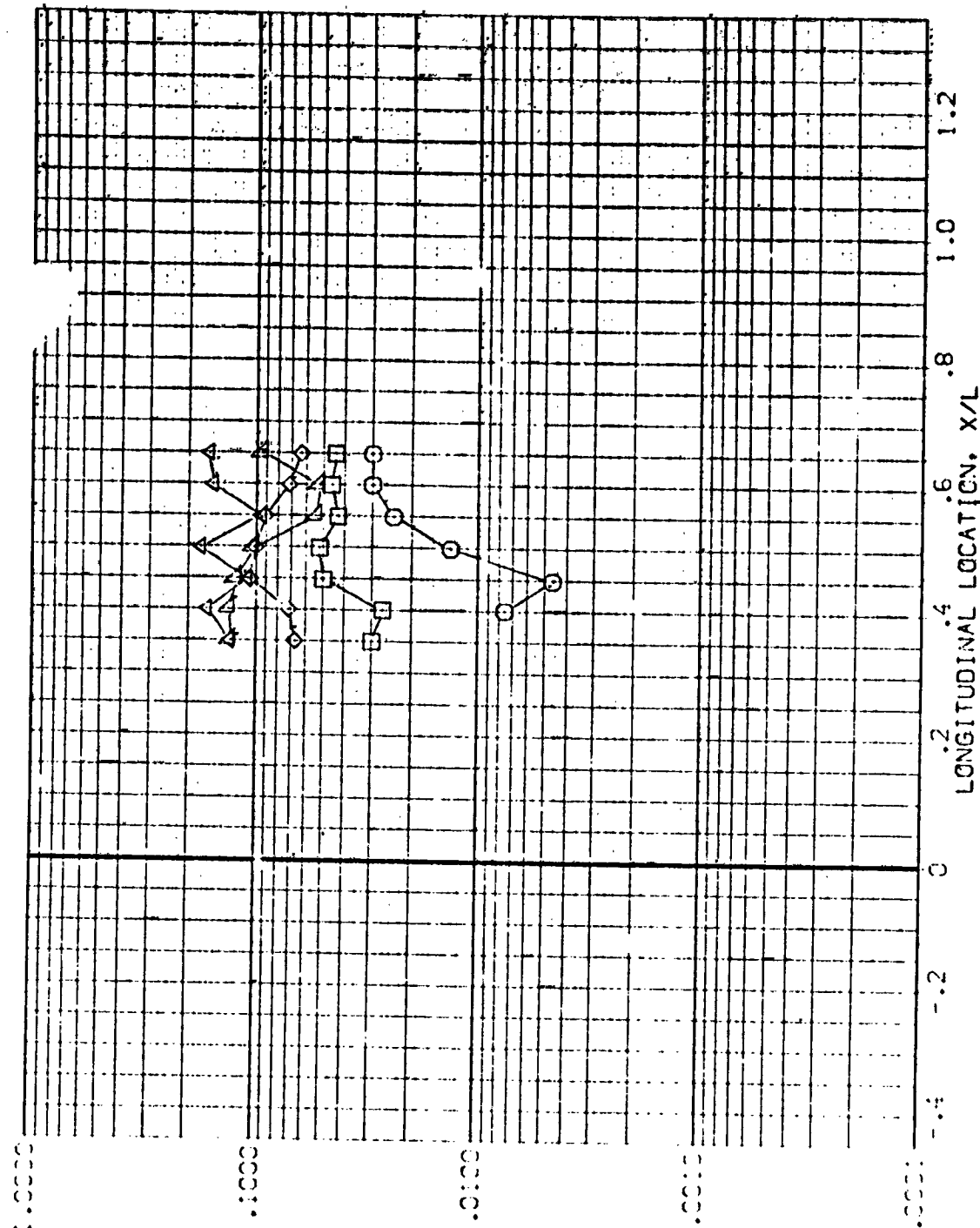


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

[illegible]



A.P.H.A.	.00000
B.I.A.	.00000
P.V.L.	.00000

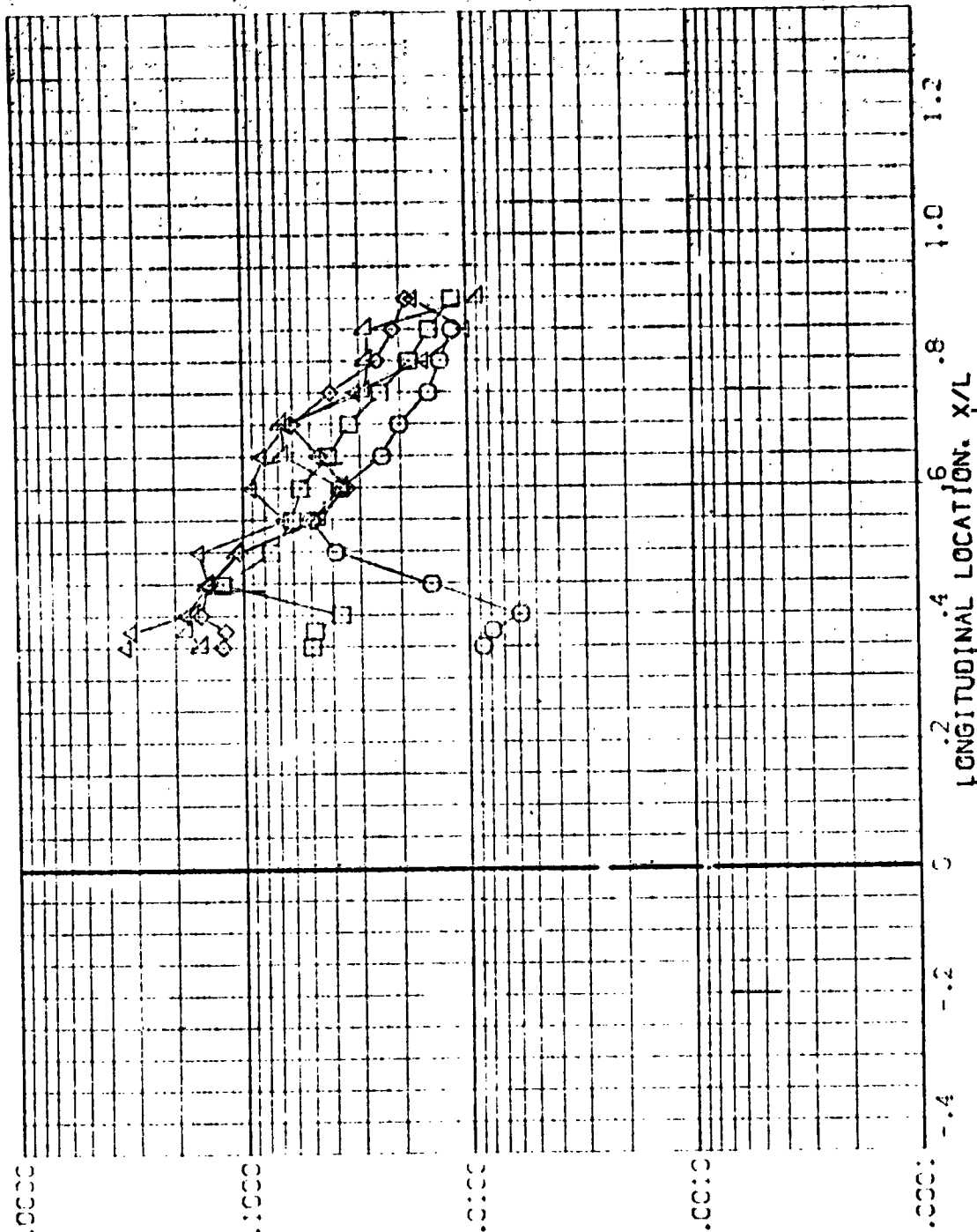
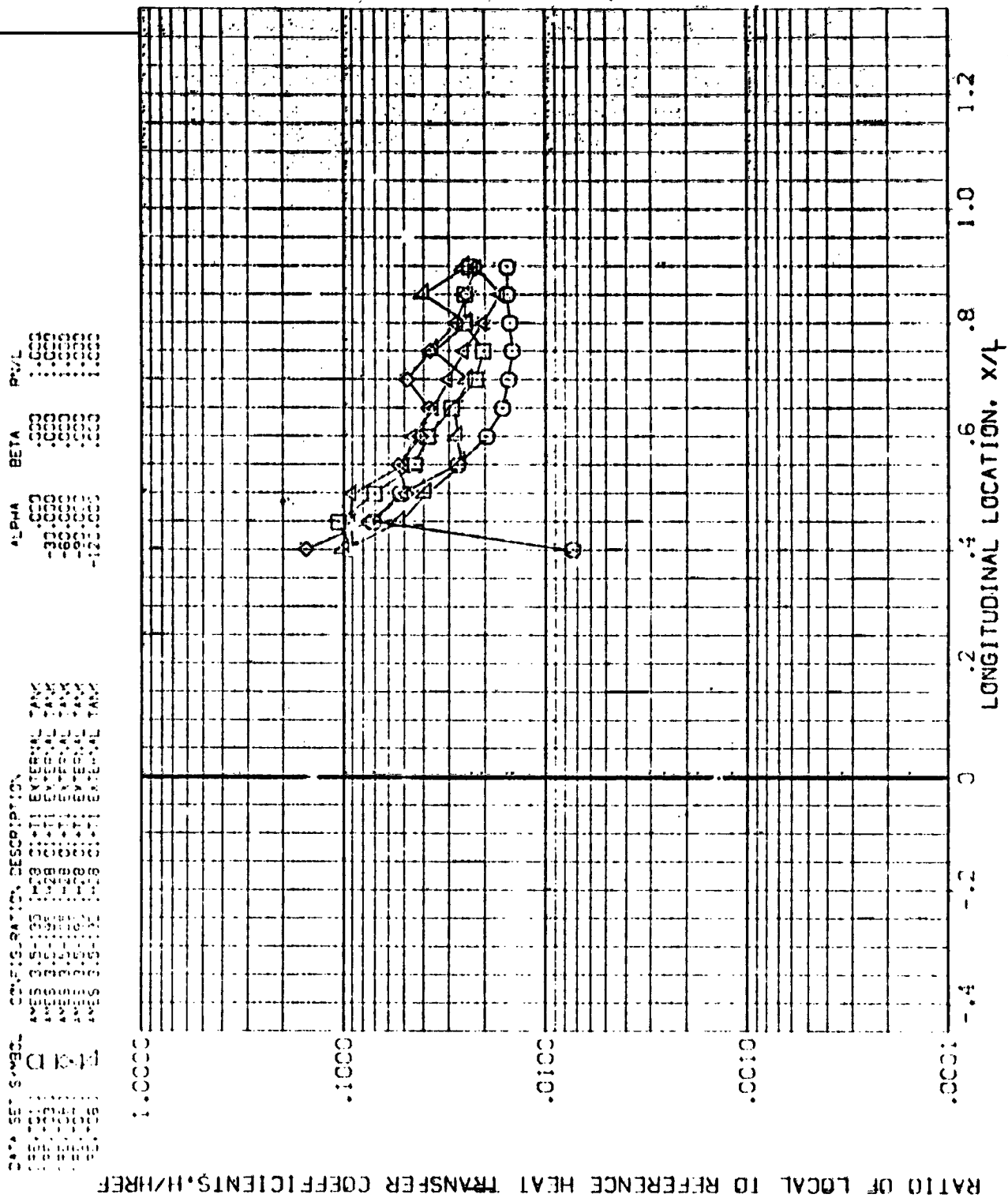


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$$5.000 + 4.400 = 9.400$$



RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

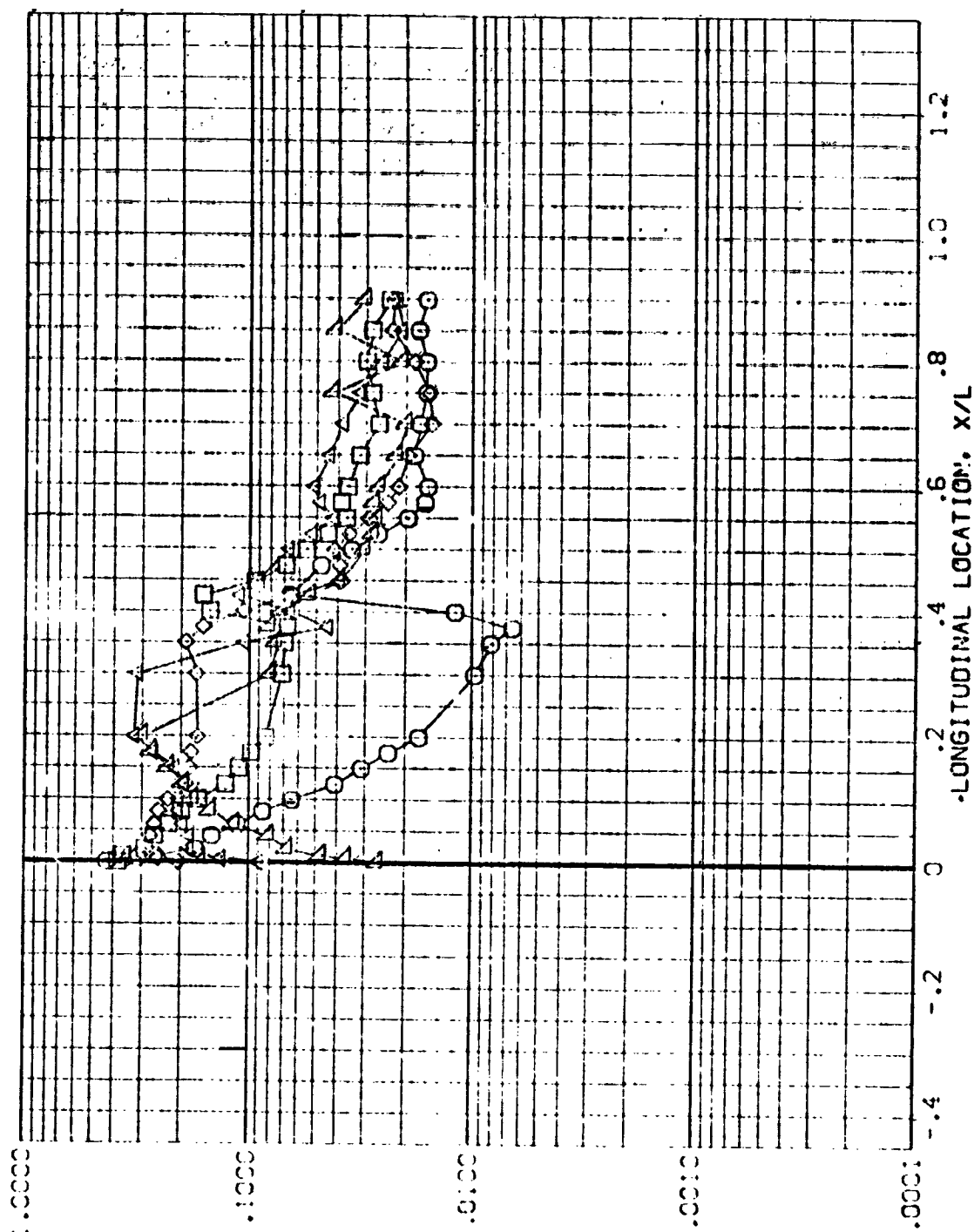
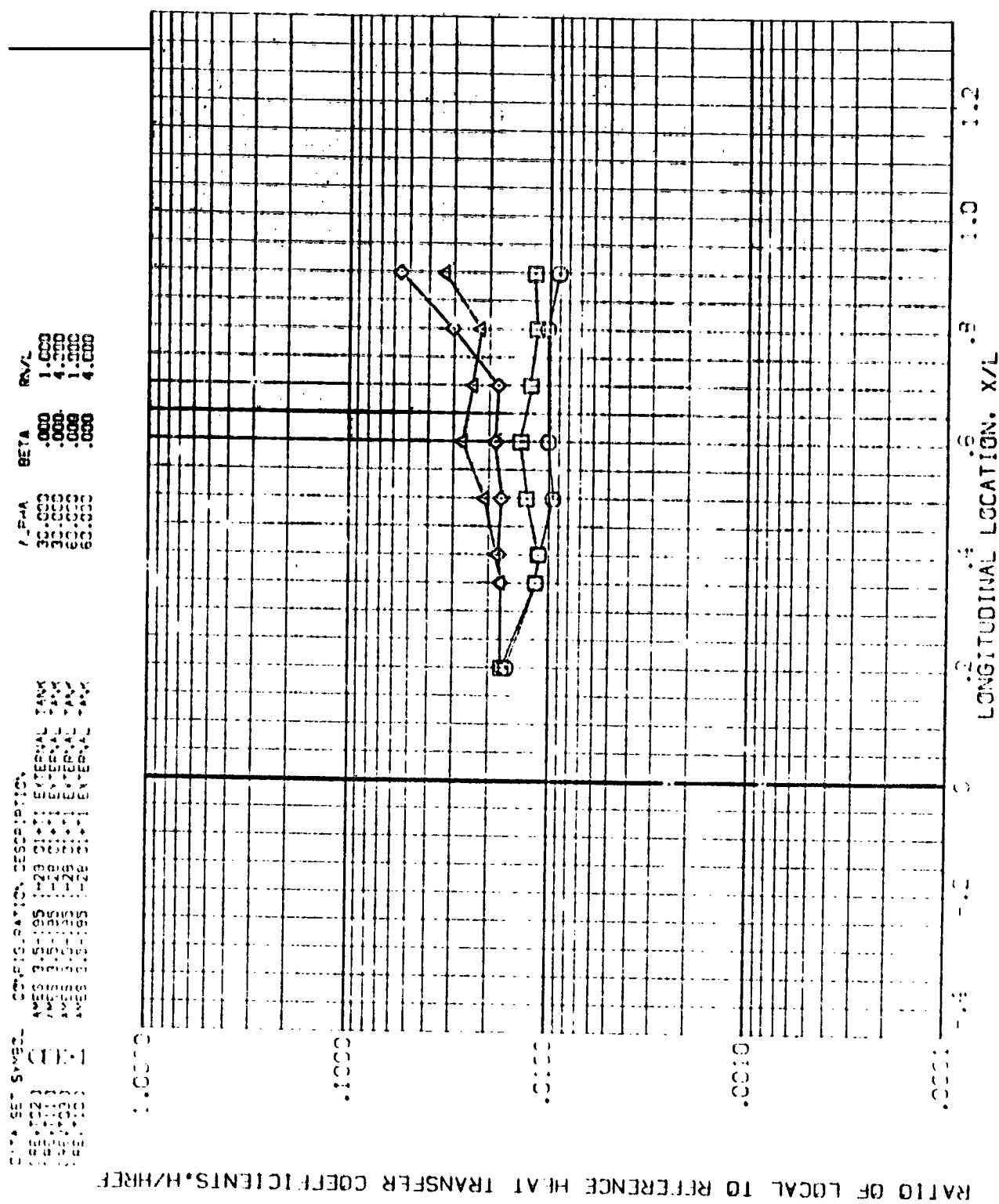


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$$5.300 \text{ MW} / 1.1 = 4.818 \text{ MW}$$



ALPHA	BETA	EVOL
30.000	.000	1.000
30.000	.000	4.000
30.000	.000	1.000
30.000	.000	4.000

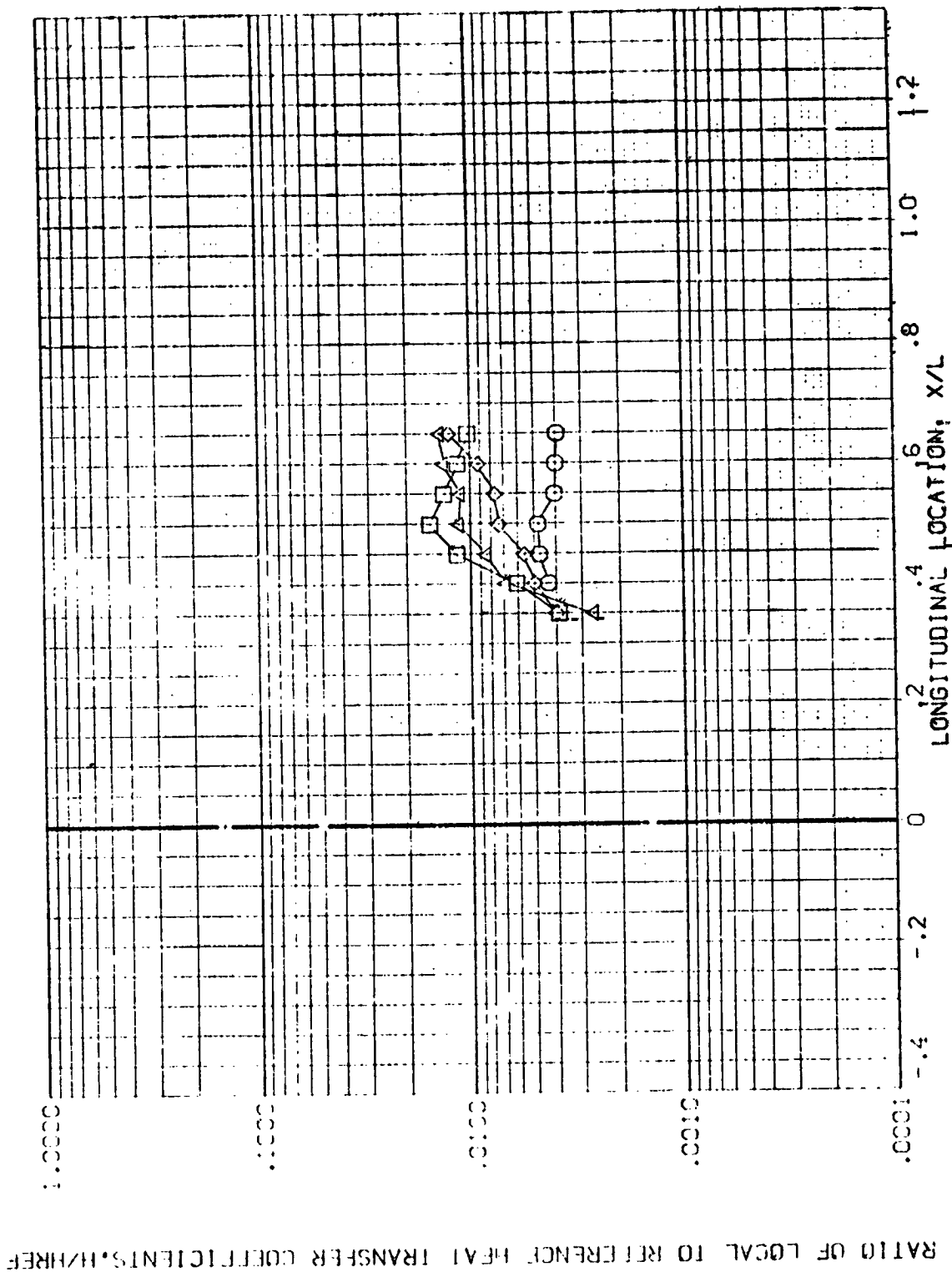


FIG. 5. TANK IN THE PRESENCE OF ORBITER

$$\frac{1}{\phi} = 5.300 \quad \frac{1}{\phi} \frac{1}{\phi} = 112.500$$

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (FE102) AXES 3.5:1.95 (H28 01+T1 EXTERNAL TANK  
 (FE101) AXES 3.5:1.95 (H28 01+T1 EXTERNAL TANK  
 (FE103) AXES 3.5:1.95 (H28 01+T1 EXTERNAL TANK  
 (FE104) AXES 3.5:1.95 (H28 01+T1 EXTERNAL TANK

LPHA BETA RNAL  
 30.000 .000 1.000  
 30.000 .000 4.000  
 60.000 .000 1.000  
 60.000 .000 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

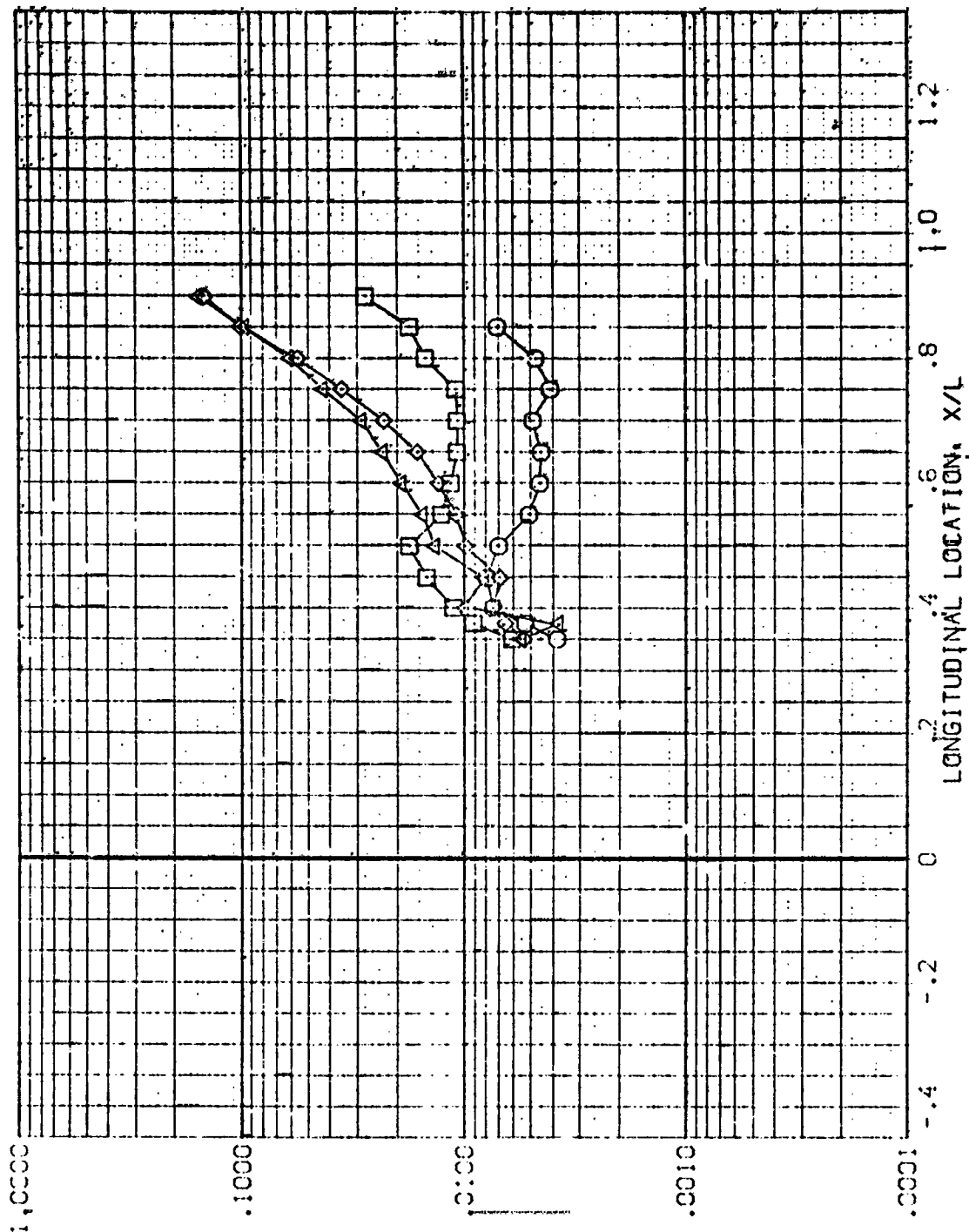


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

MACH = 5.200 HAW/HT = .900 PHI = 135.000

ALPHA	BETA	PN/L
30.000	.000	1.000
30.000	.000	4.000
60.000	.000	1.000
60.000	.000	4.000

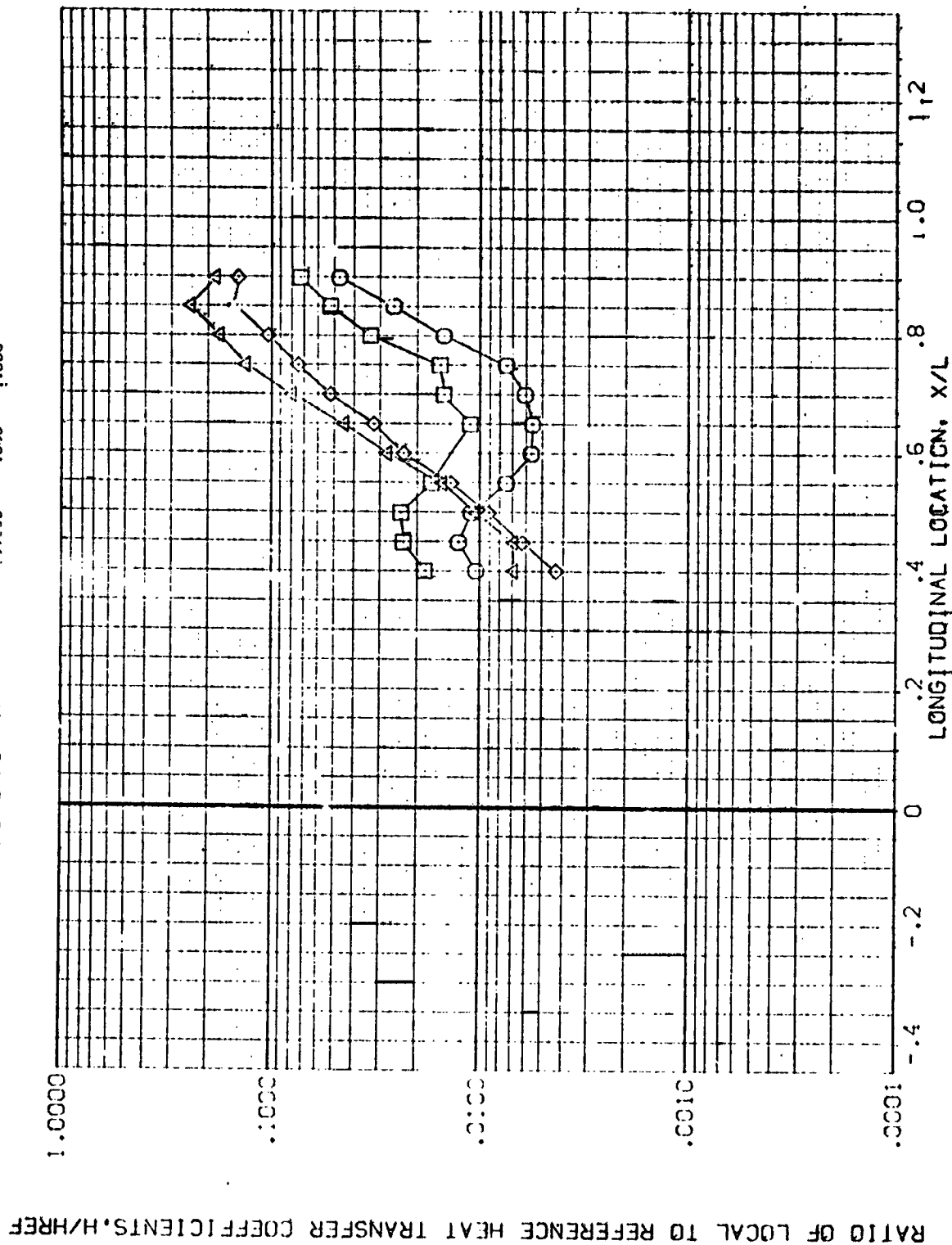


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

$\frac{1}{\text{M}_w} =$	$\frac{1}{5.96}$	$\frac{1}{\text{M}_n} =$	$\frac{1}{107.500}$	$\text{PDI} =$	$18.1$
--------------------------	------------------	--------------------------	---------------------	----------------	--------

DATA SET SYMBOL  
 1000  
 1001  
 1002  
 1003  
 1004  
 1005  
 1006  
 1007  
 1008  
 1009  
 1010

CONFIGURATION DESCRIPTION  
 1000 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1001 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1002 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1003 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1004 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1005 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1006 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1007 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1008 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1009 3.5 1.05 1000 01.11 EXTERNAL TANK  
 1010 3.5 1.05 1000 01.11 EXTERNAL TANK

ALPHA BETA RV/L  
 20.000 .000 1.000  
 30.000 .000 4.000  
 60.000 .000 1.000  
 80.000 .000 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

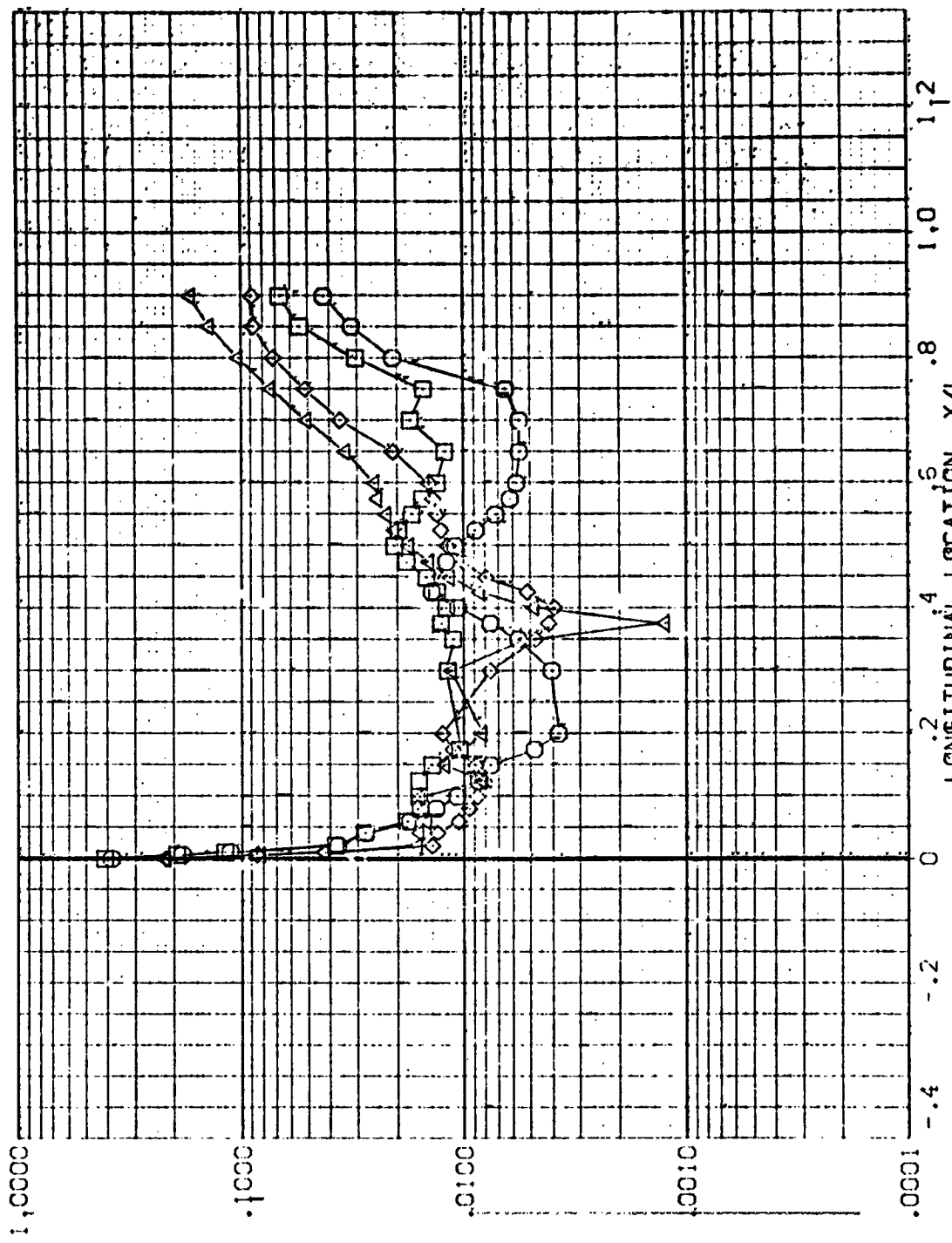


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

WICH = 5.300 HAW/HI = .900 PHI = .90.000



DATA SET SYMBO: CONFIGURATION DESCRIPTION  
 (RE.T02) ANES 3.5-195 (P38 01+T) EXTERNAL TANK  
 (RE.T12) ANES 3.5-195 (P38 01+T) EXTERNAL TANK

ALPHA BETA RV/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

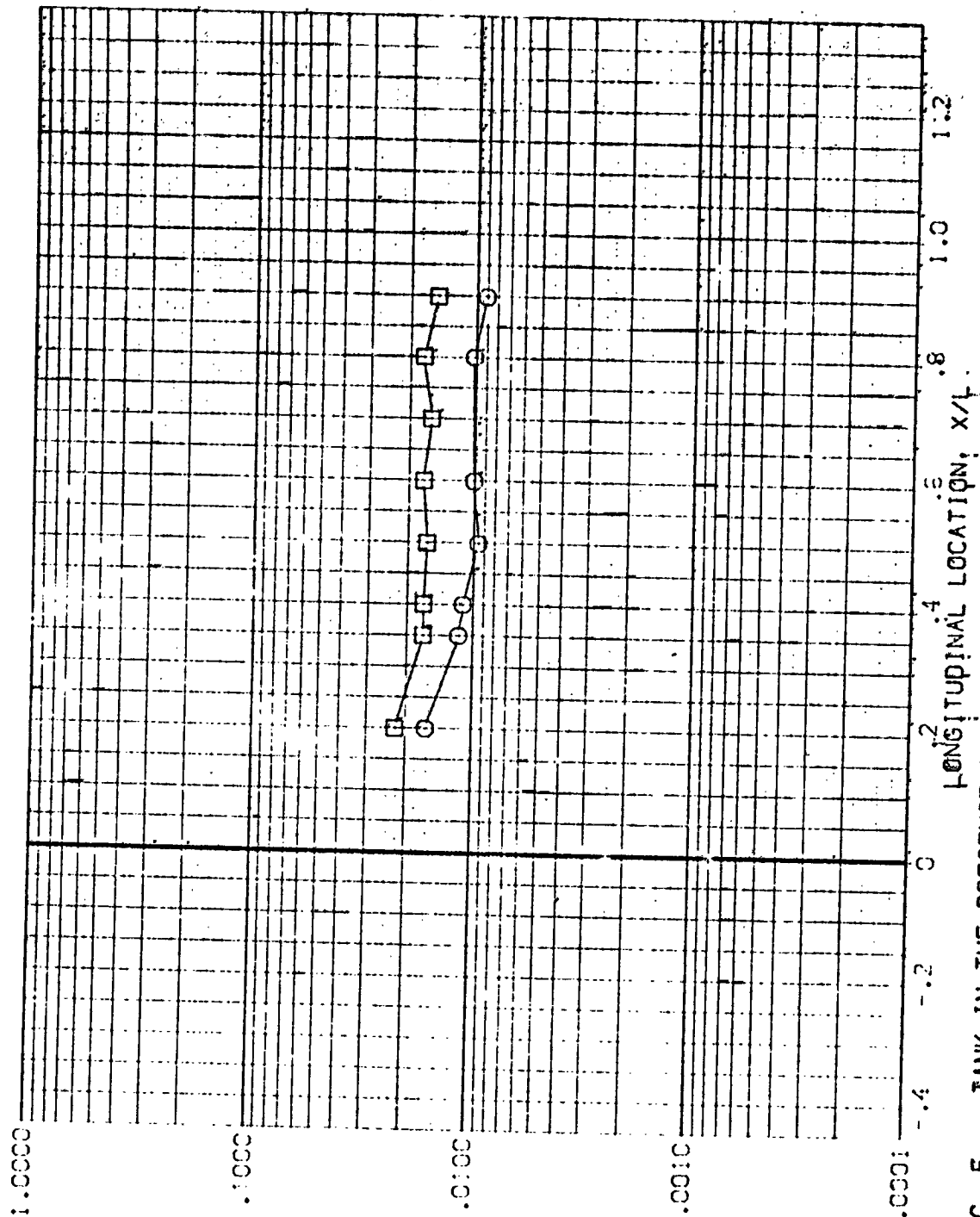


FIG. 5 TANK IN THE PRESENCE OF ORBITER

$\mu = 5.300$   $L^2 W / HT = .900$   $PHI = 90,000$

DATA SET SYMBOL: [ ]  
 (REV:02)  
 (REV:13)

CONFIGURATION DESCRIPTION

AXES 3.5-195 1428 01-11 EXTERNAL TANK  
 AXES 3.5-195 1428 01-11 EXTERNAL TANK

ALPHA BETA PV/L  
 10.000 1.000 1.000  
 10.000 1.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

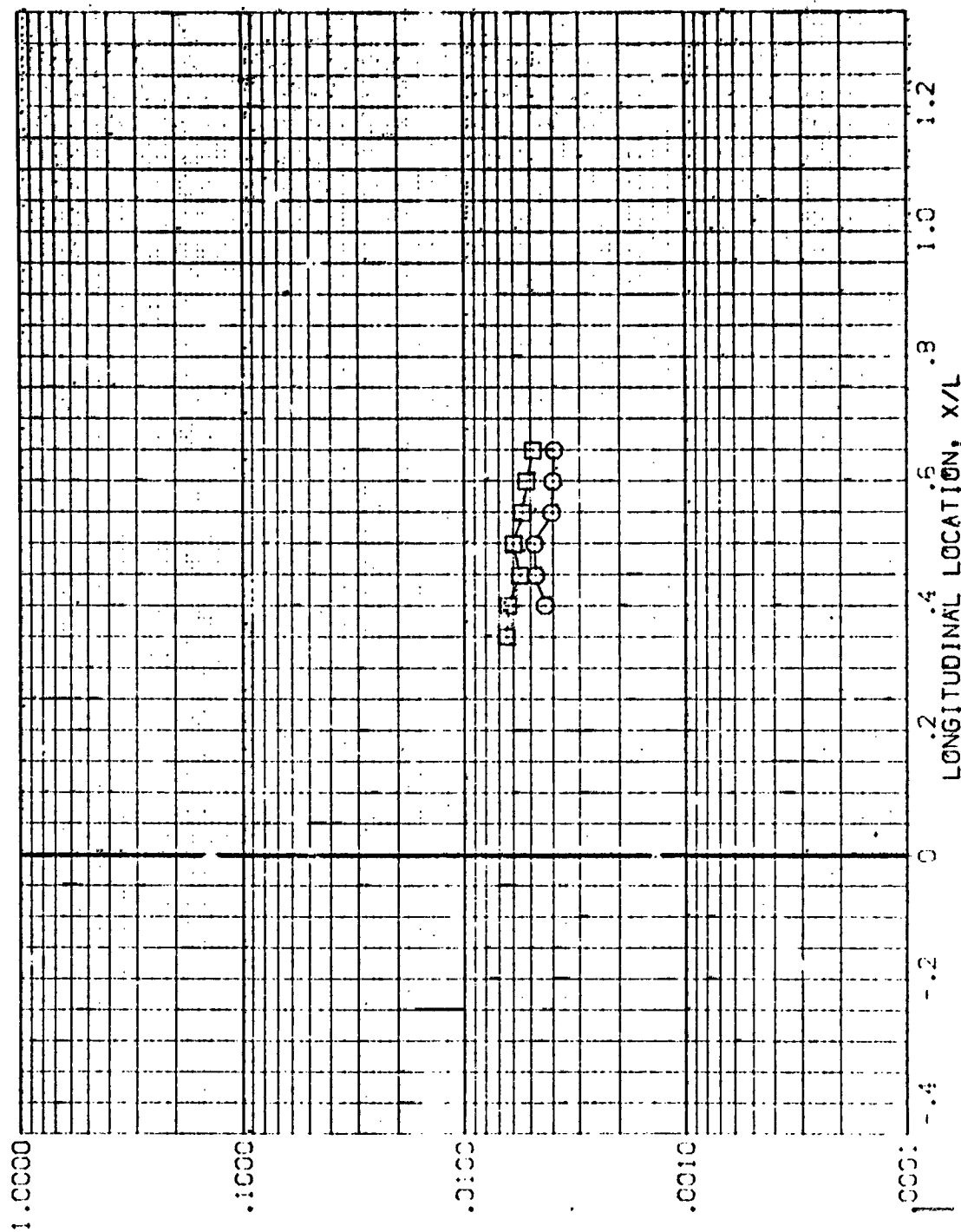


FIG. 5 TANK, IN THE PRESENCE OF 0 BITER

MACH = 5.000 HAW/HTE = .900 P41 = 1.12 500

DATA SET SYM32- CONFIGURATION DESCRIPTION  
 (REV102) ANES 3.5-195 (H28 CI+T) EXTERNAL TANK  
 (REV112) ANES 3.5-195 (H28 CI+T) EXTERNAL TANK

ALPHA BETA RV/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

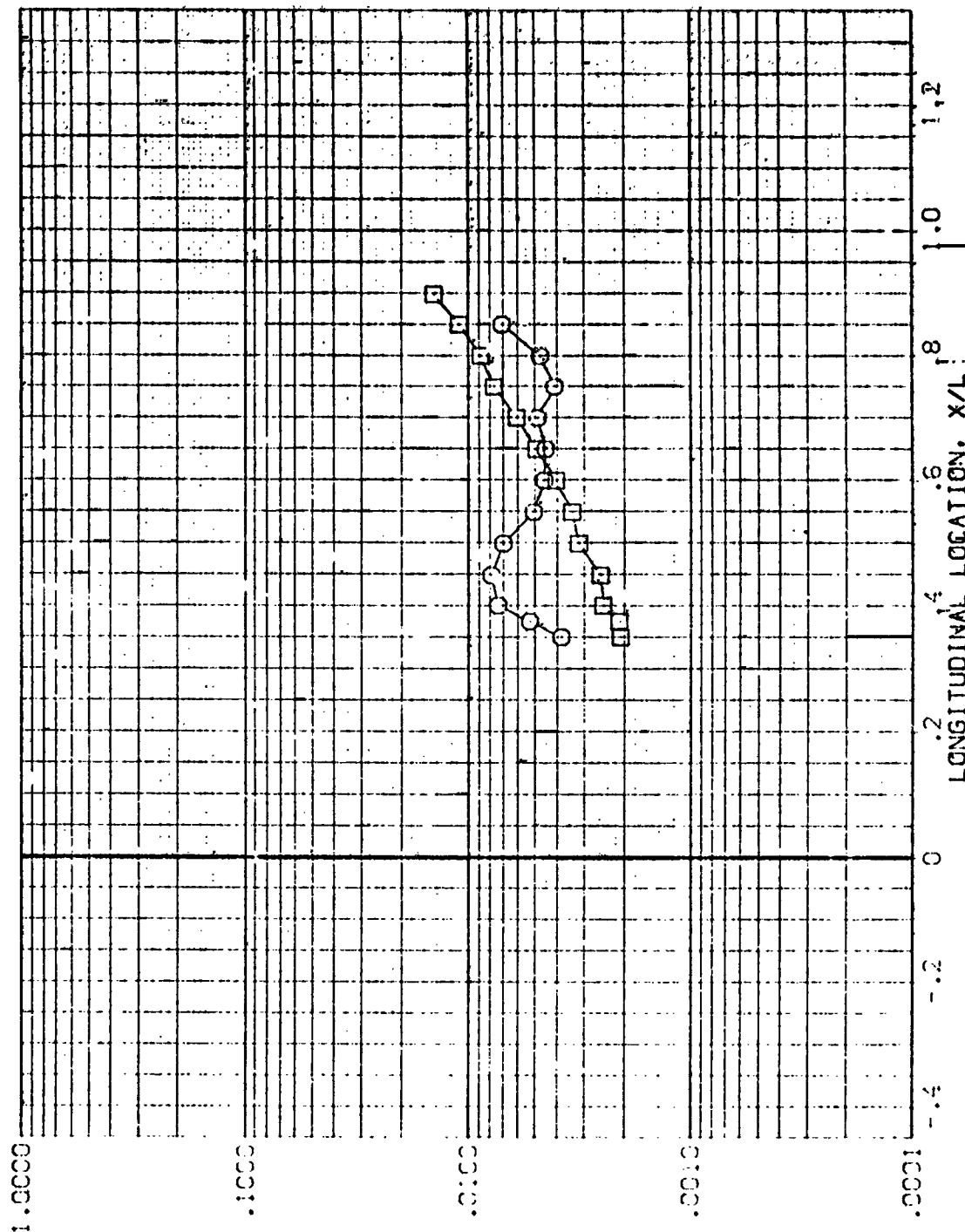


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

MACH = 5.000  $\phi$  = 0.000  $\phi$  = 135.000

REPRODUCED FROM  
 ORIGINAL PART 18

DATA SET S-VES-  
 CONFIDENCE DESCRIPTION  
 AYES 3.0-1.95 1-28 01+11 EXTERNAL TANK  
 AYES 3.5-1.95 1-28 01+11 EXTERNAL TANK

ALPHA BETA R/V/L  
 30.000 30.000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

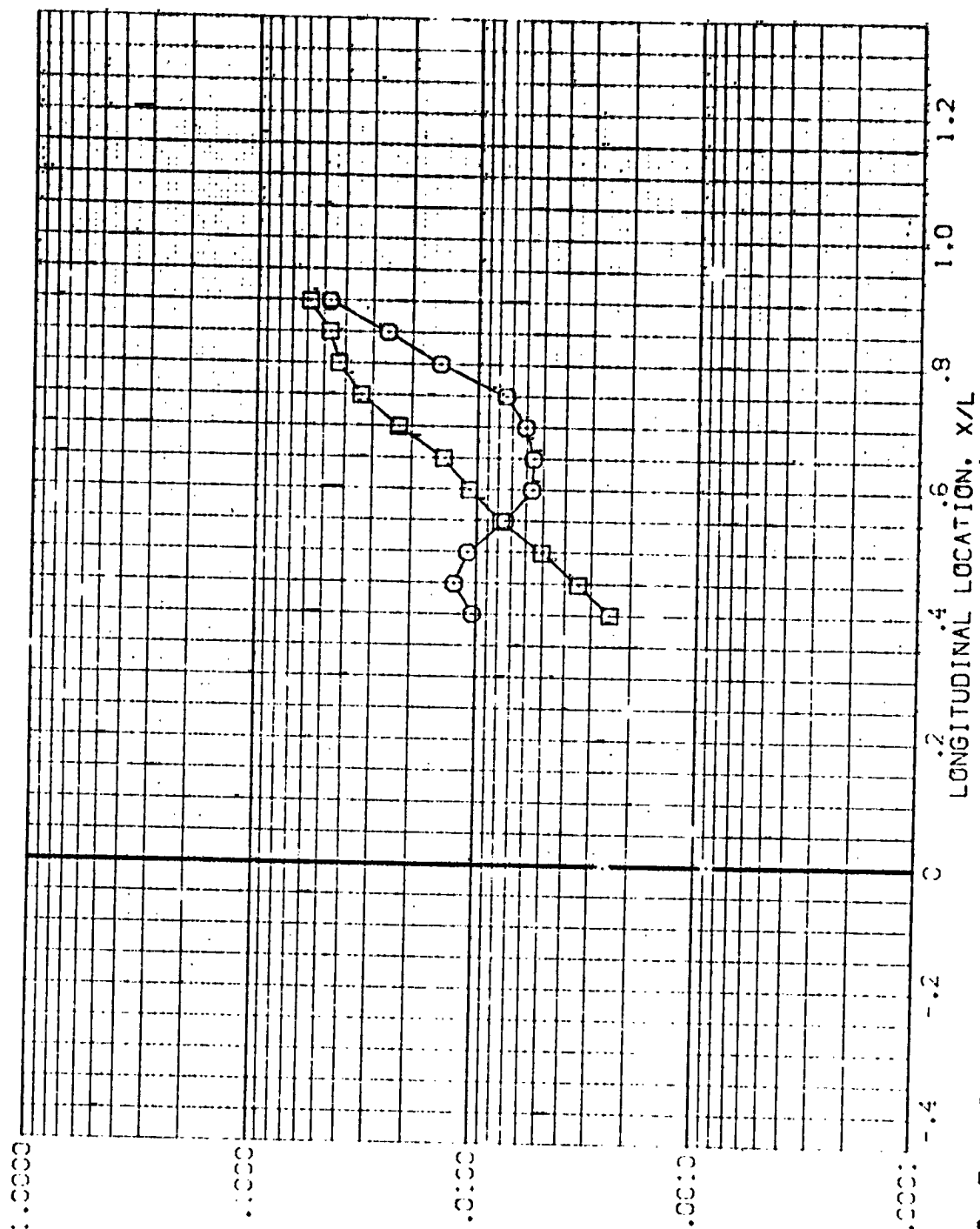


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

MAC = 5.300  $\mu$ W/FT<sup>2</sup> = 0.900 PHI = 157.500

DATA SET 5432: CONFIGURATION DESCRIPTION  
 (REV. 12) AYES 3.5-195 (428 01.11) INTERNAL TANK  
 (REV. 12) AYES 3.5-195 (428 01.11) EXTERNAL TANK

ALPHA BETA RV/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

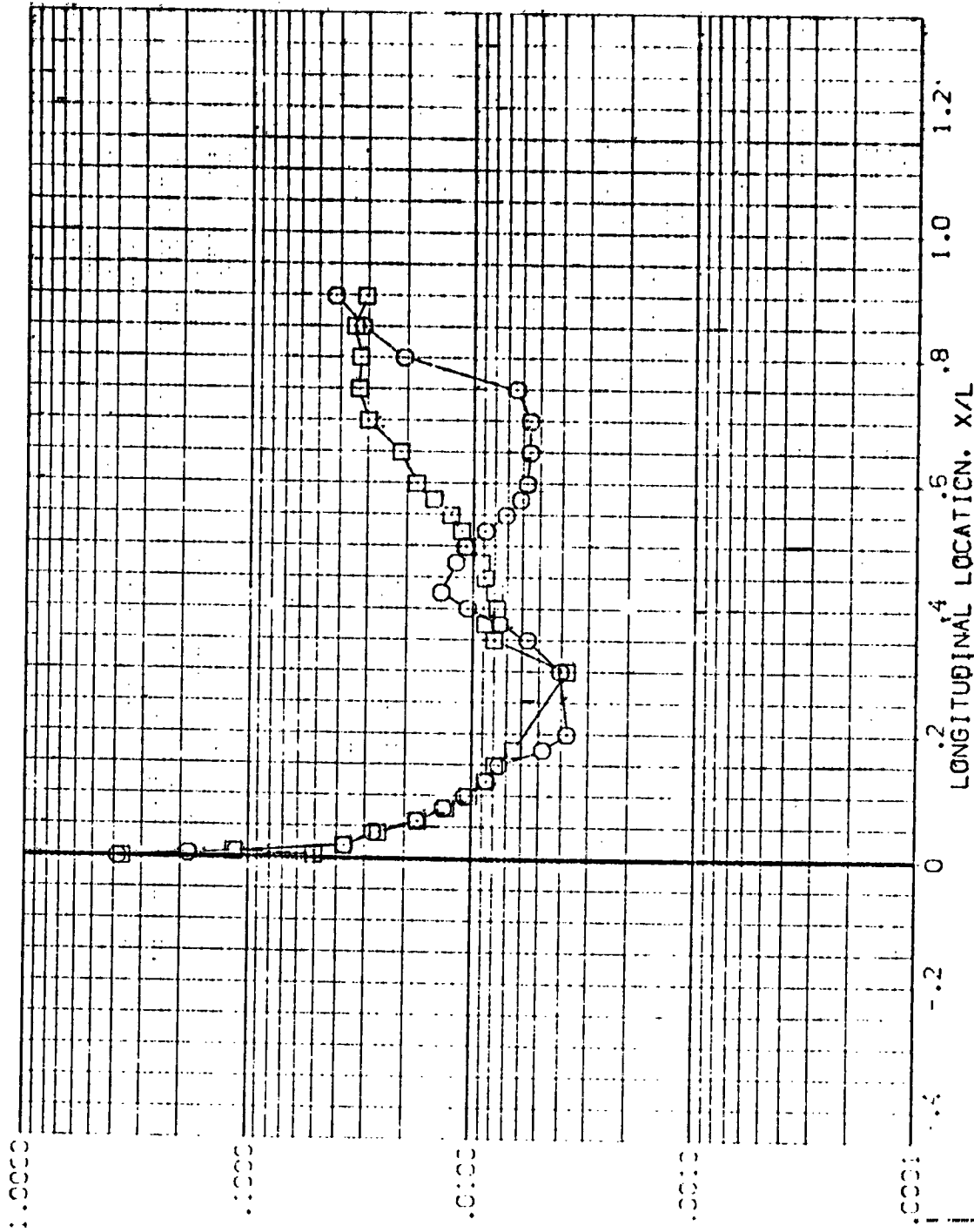


FIG. 5 TANK, IN THE PRESENCE OF ORBITER

W/D = 5.300 W/DREF = .800 P/D = 30.000



AVES 3.5-195 IH28 CI+TI EXTERNAL TANK

(BEVT01)

SAVED  
PHI  
157.500  
180.000

MA, HT MACH  
.900 5.222

PARAMETRIC VALUES  
ALPHA .000  
BETA 1.000  
RVAL .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

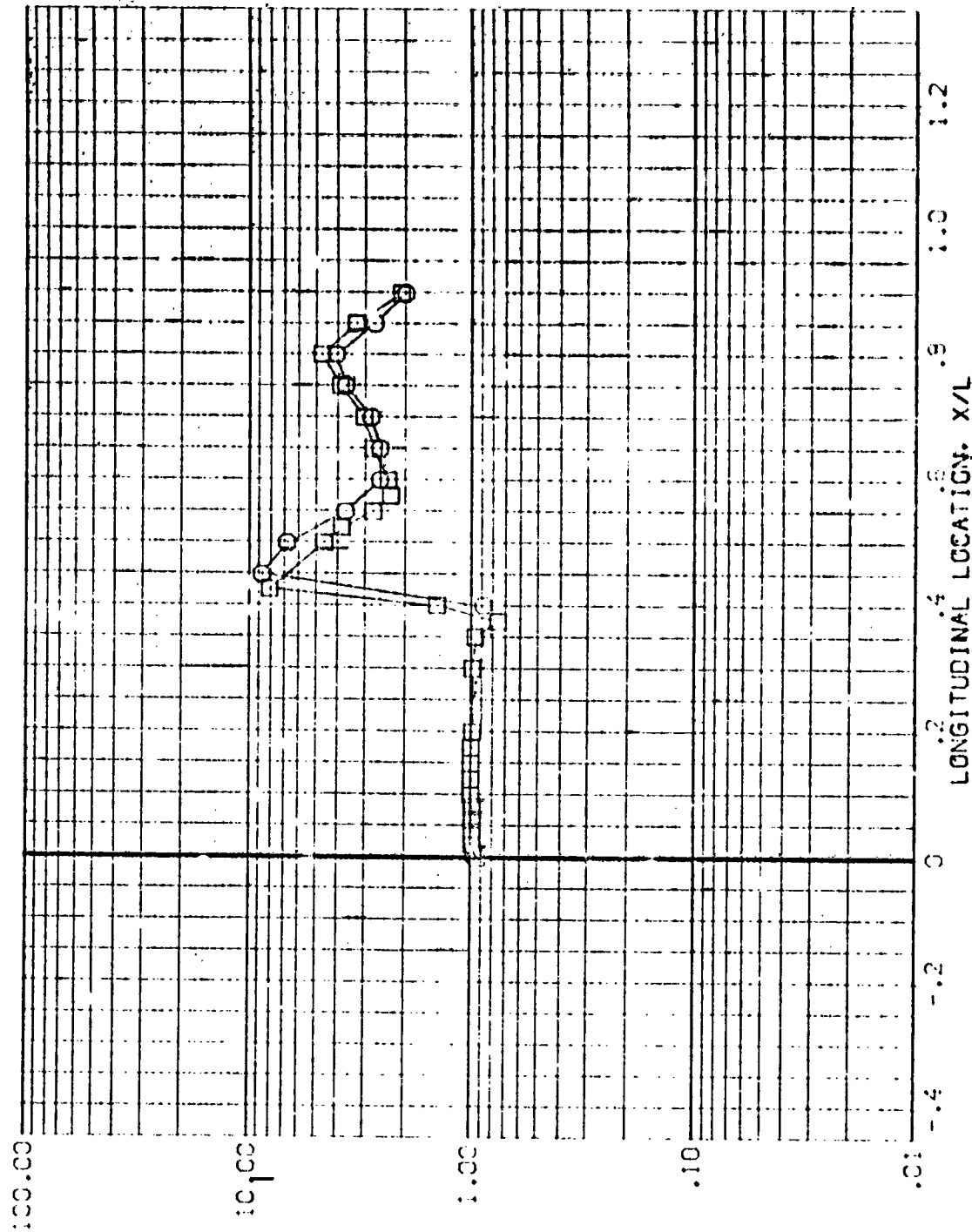


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 1-28 01-T: EXTERNAL TANK

(SEE FIG. 1)

SYNO-  
PHI  
1.000  
40.000  
57.500  
90.000  
112.500  
135.000  
100.000

WAVE  
1.500  
5.000

PARAMS AND VALUES  
ALPHA  
5%/L  
-123.000  
BETA  
1.000  
.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H/H_U$

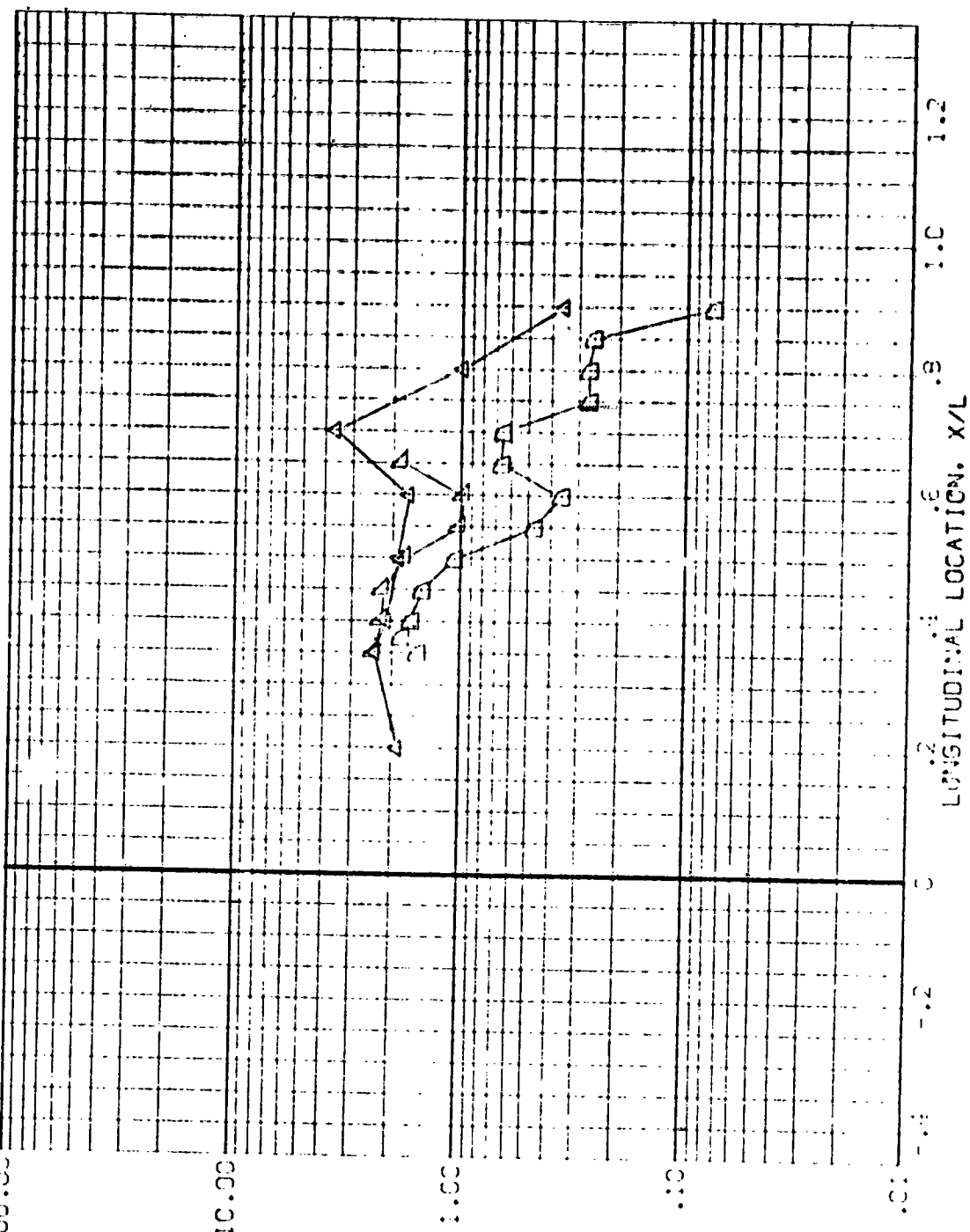


FIG. 6 TANK. RATIO OF INTERFERENCE TO UNDISTURBED



AVES 2.5-195 1-28 01+11 EXTERNAL TANK

(BEVT08)

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
R/L 1.000

AVES 2.5-195 1-28 01+11 EXTERNAL TANK  
R/L 1.000  
ALPHA -120.000 BETA .000  
R/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

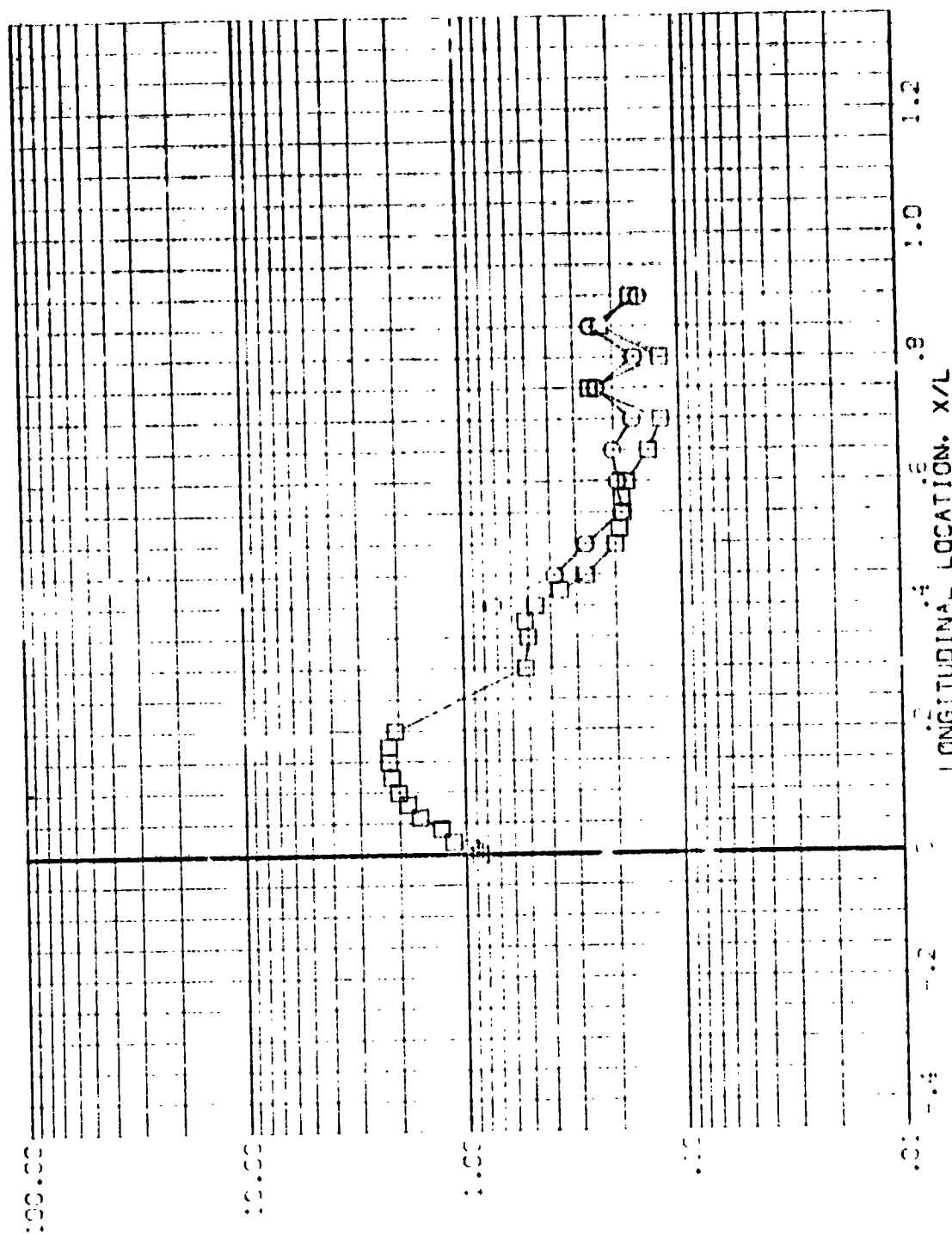


FIG. 6 TANK. RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT07)

SWEEP PHI 137.500 MACH 5.219  
180.000

PARAMETRIC VALUES  
ALPHA -70.000 BETA .000  
RM/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

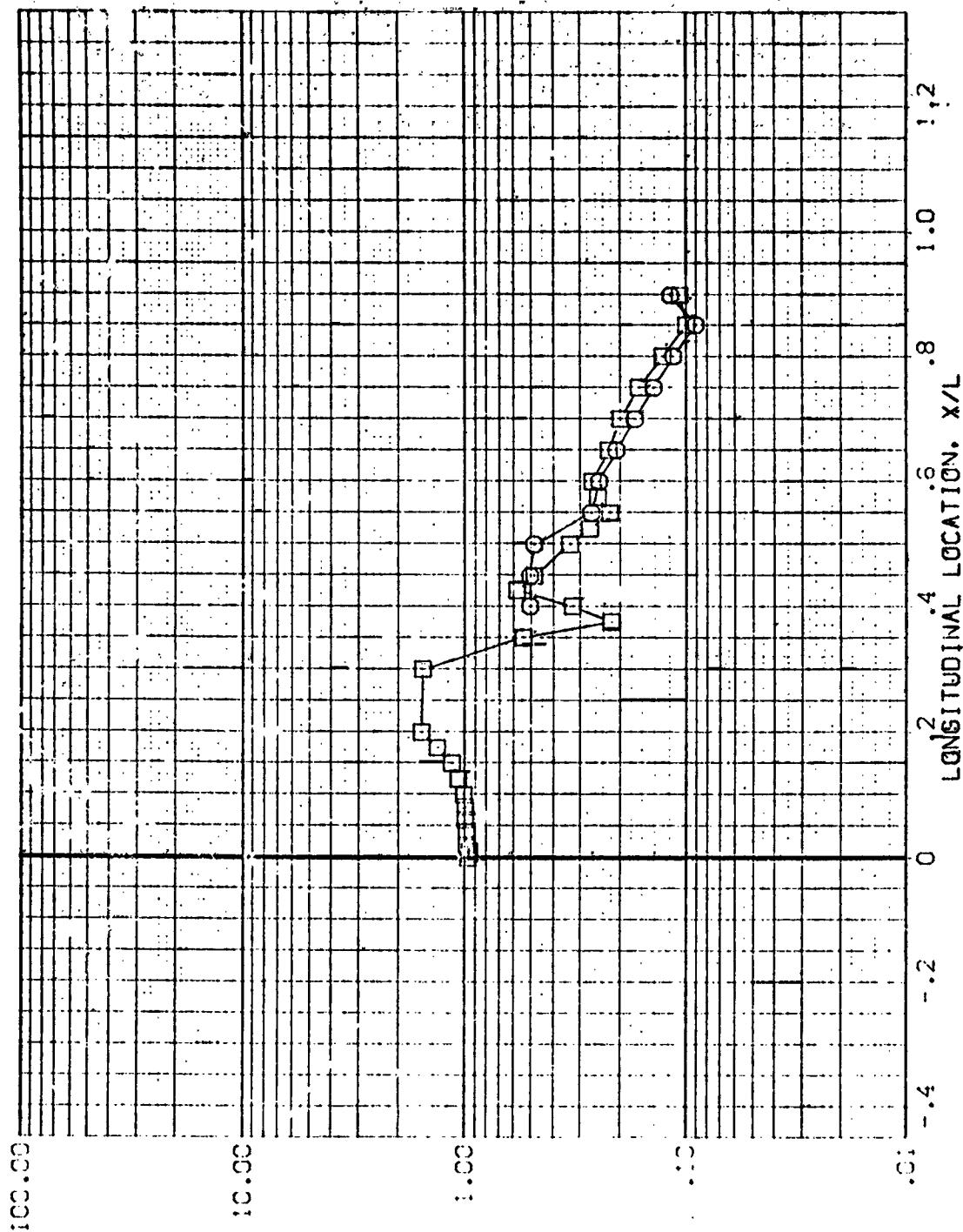


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT08)

SYNCD PHI WAVELENGTH MACH  
 .000 .900 5.220  
 45.000  
 67.500  
 90.000  
 112.500  
 135.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 RH/L 1.000

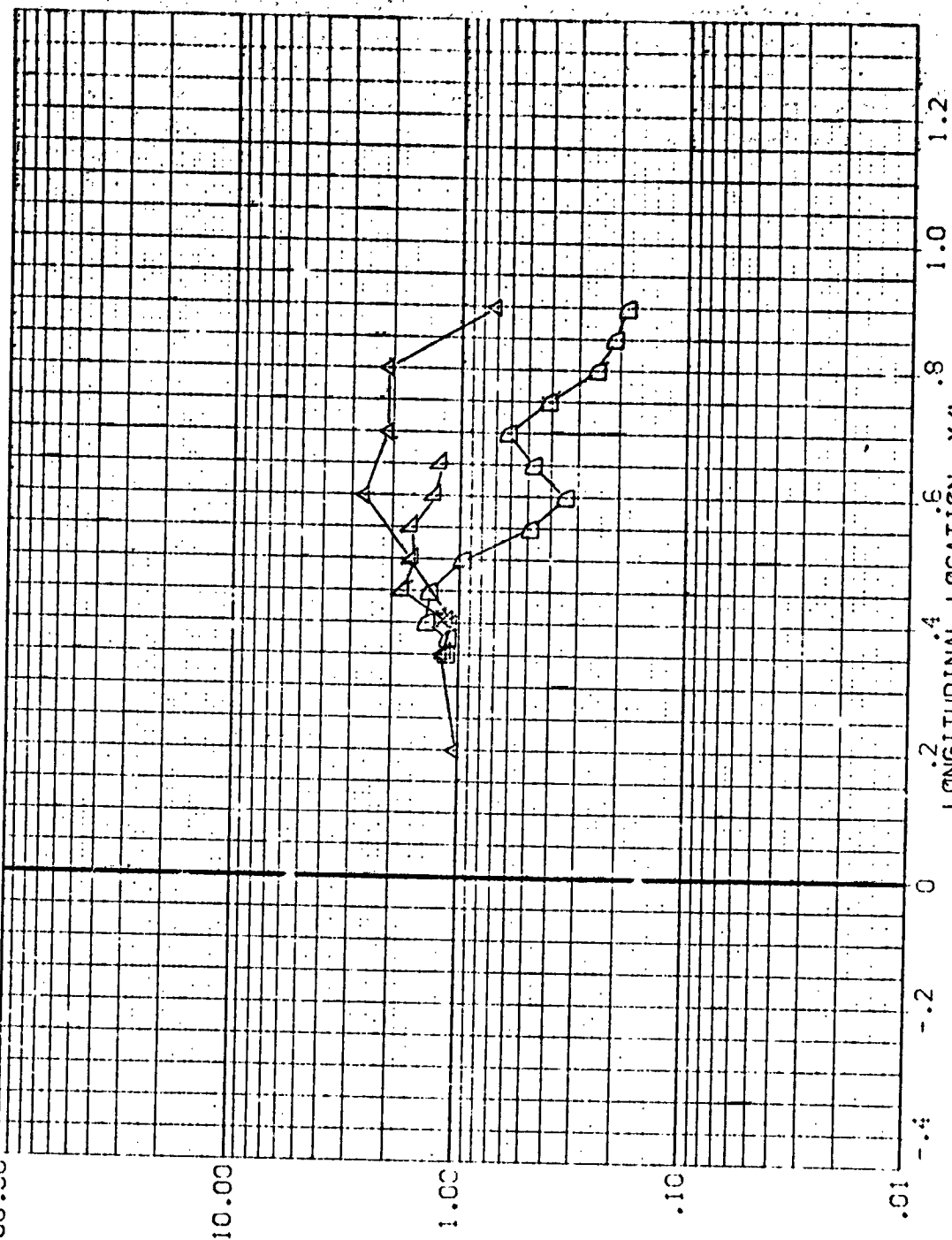


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVTC6)

SYMBOL

PHI

HAW/HT

MACH

157.500

.900

5.220

180.000

PARAMETRIC VALUES

ALPHA

70.000

BETA

.000

PM/L

1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

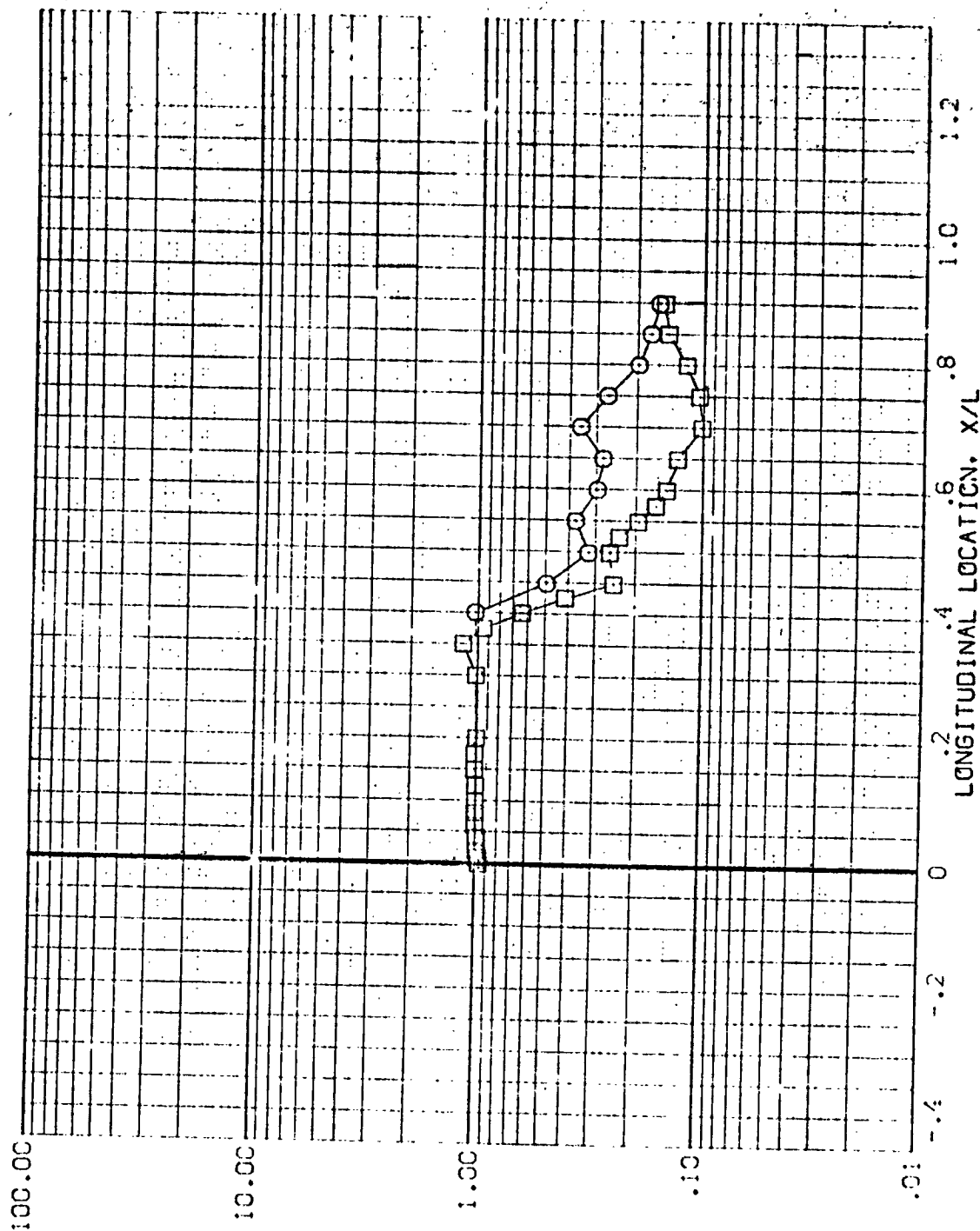


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT09)

S-VECT. PHI  
 .000  
 45.000  
 67.500  
 90.000  
 112.500  
 135.000

HAW/HT .900  
 MACH 5.219

PARAMETRIC VALUES  
 ALPHA  
 $\beta$ /L  
 -30.000  
 1.000  
 BETA  
 .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

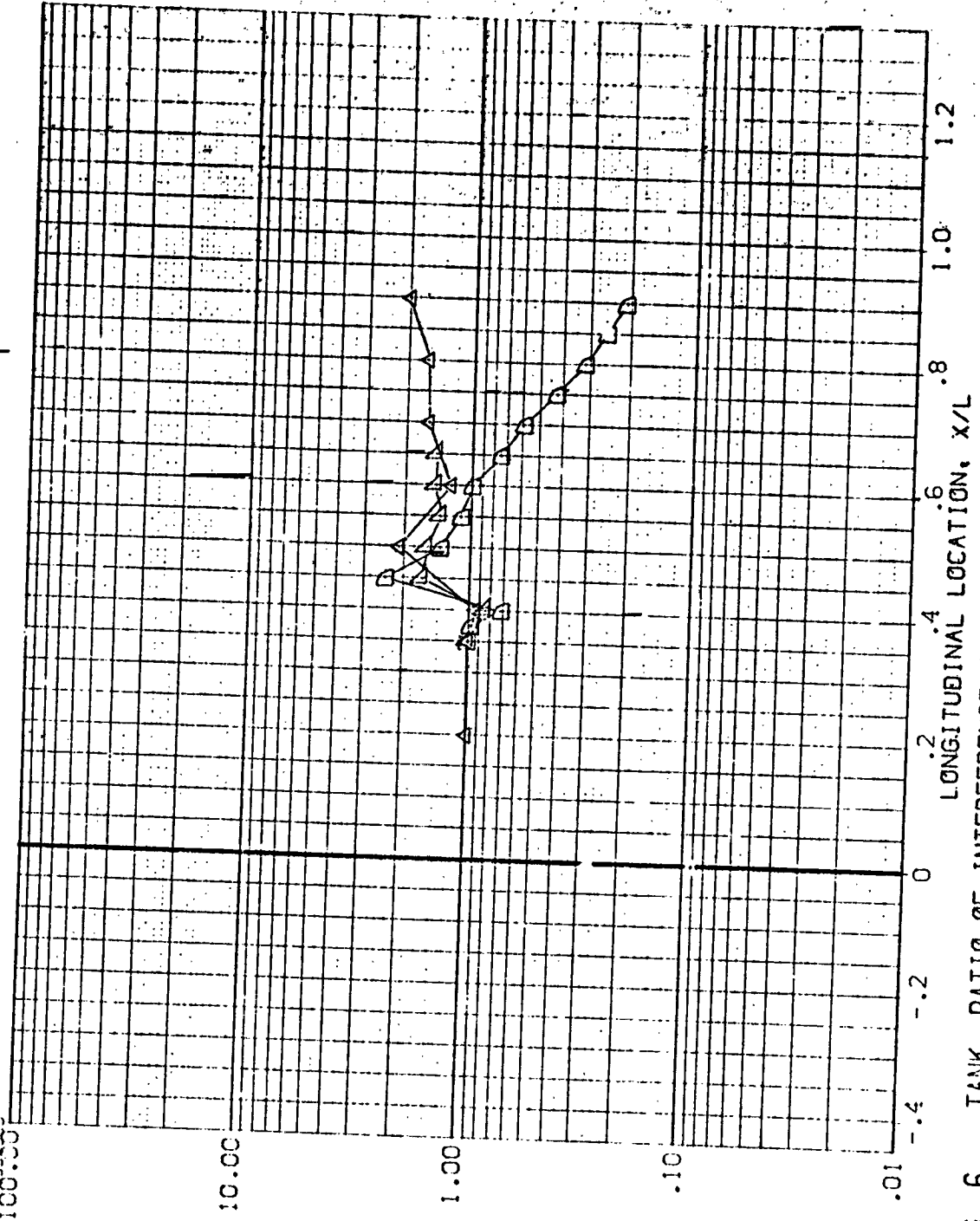


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-1.95 IH28 01+T1 EXTERNAL TANK

(BEVT09)

NO

SAVE

PHI

157.500

180.000

WAVE/T

.900

MACH

5.219

PARAMETRIC VALUES

-20.000

BETA

.000

1.000

RN/L

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

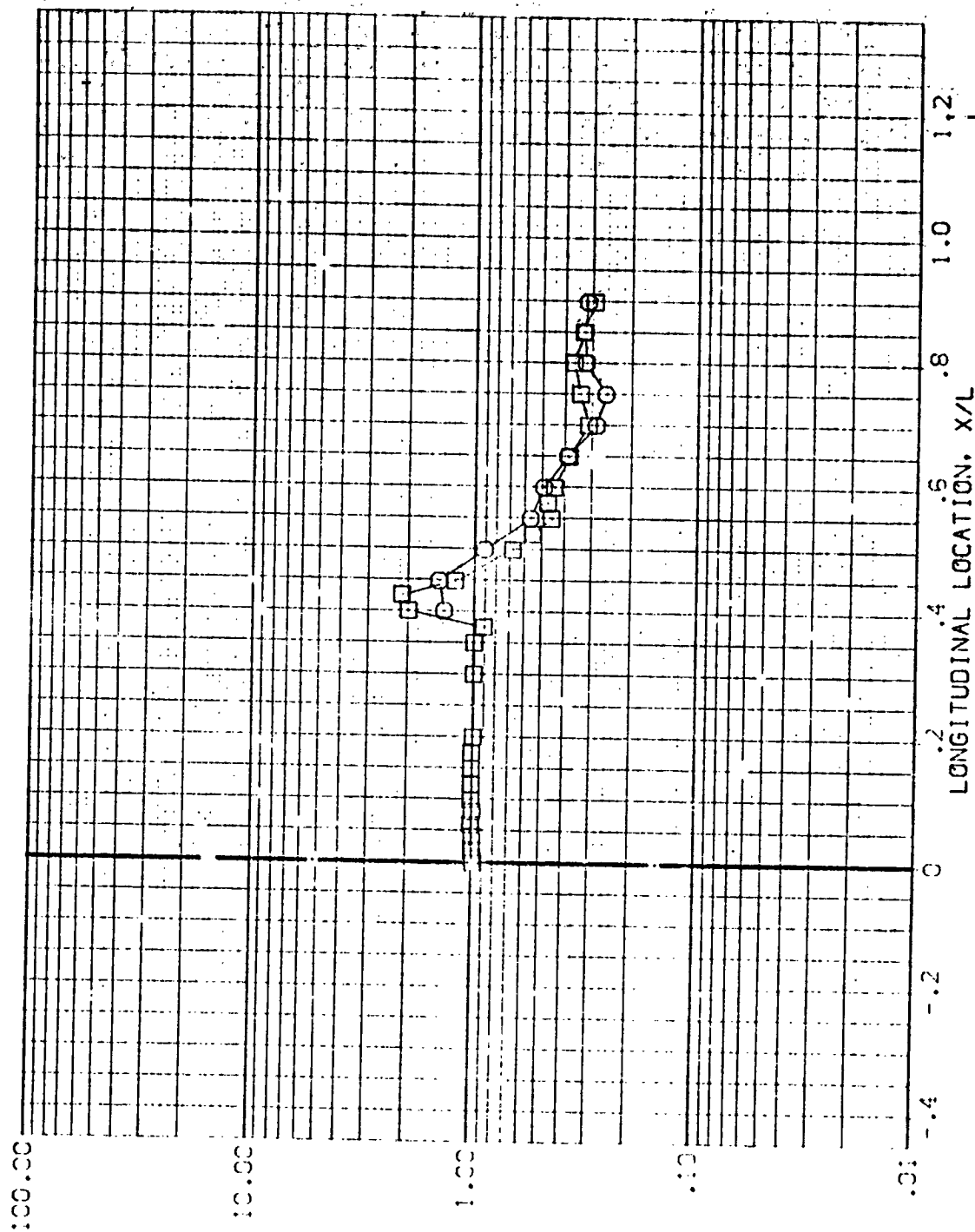


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5:195 IH28 01+T1 EXTERNAL TANK

(BEVT01)

PARAMETRIC VALUES  
ALPHA .000 BETA .000  
RN/L 1.000

X/L .350  
H/H/T .900 MACH 5.222

SWEEP

0.000  
0.010  
0.020  
0.030  
0.040  
0.050  
0.060  
0.070  
0.080  
0.090  
0.100

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

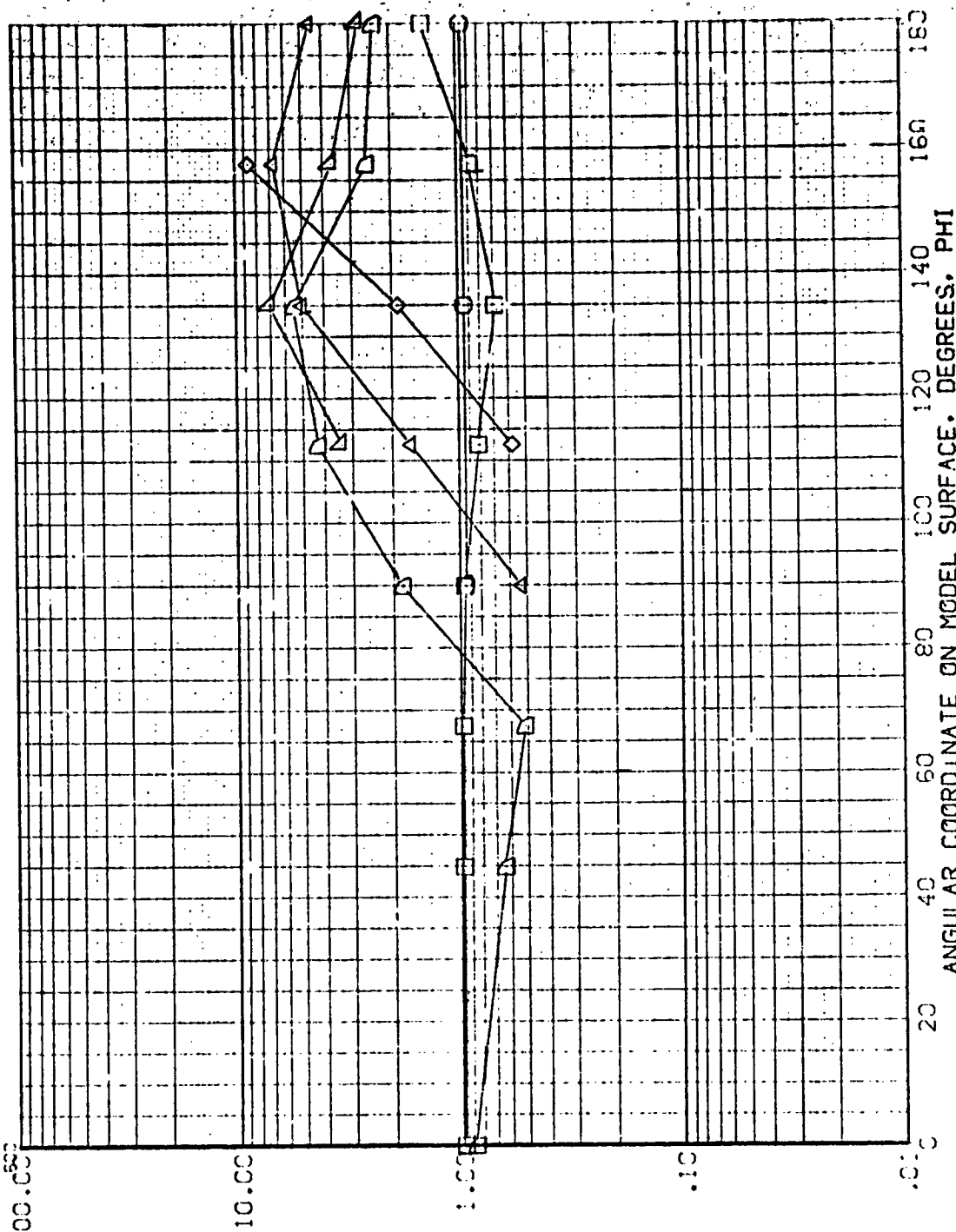


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(REV 10)

070440

5-26-58

X

HA <sub>2</sub> W/HT	CH
CC6	5.222

ALPHA  
PXL

BETA

0000

333

333

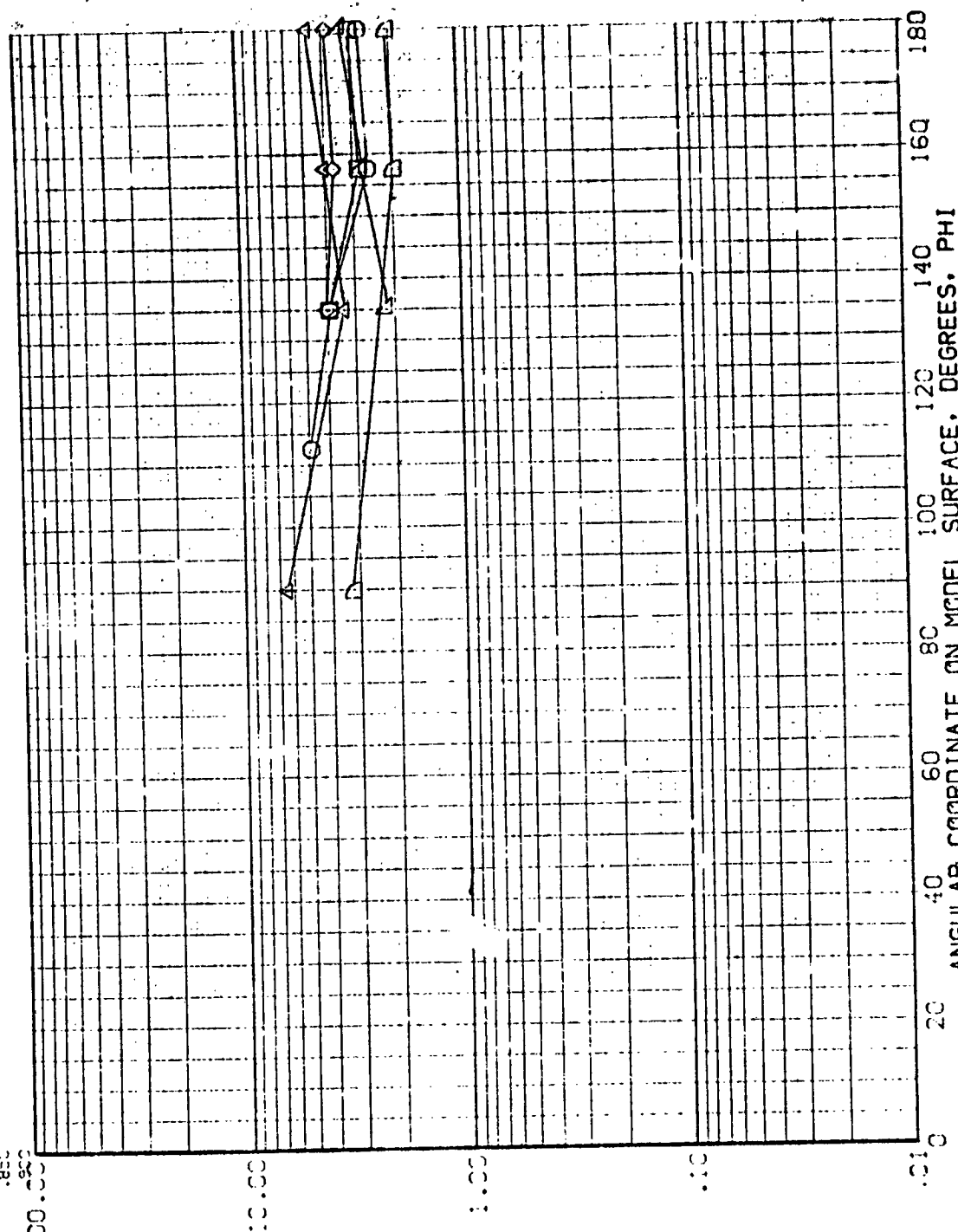


FIG. 6  
TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 1428 01+T1 EXTERNAL TANK

(BE/T06)

SV/SEC X/L --W/H-- VACH

.350  
.400  
.450  
.500  
.550

.300 5.220

PARAMETRIC VALUES  
ALPHA -120.000  
BETA 1.000  
RN/L .300

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H_i/H_u$

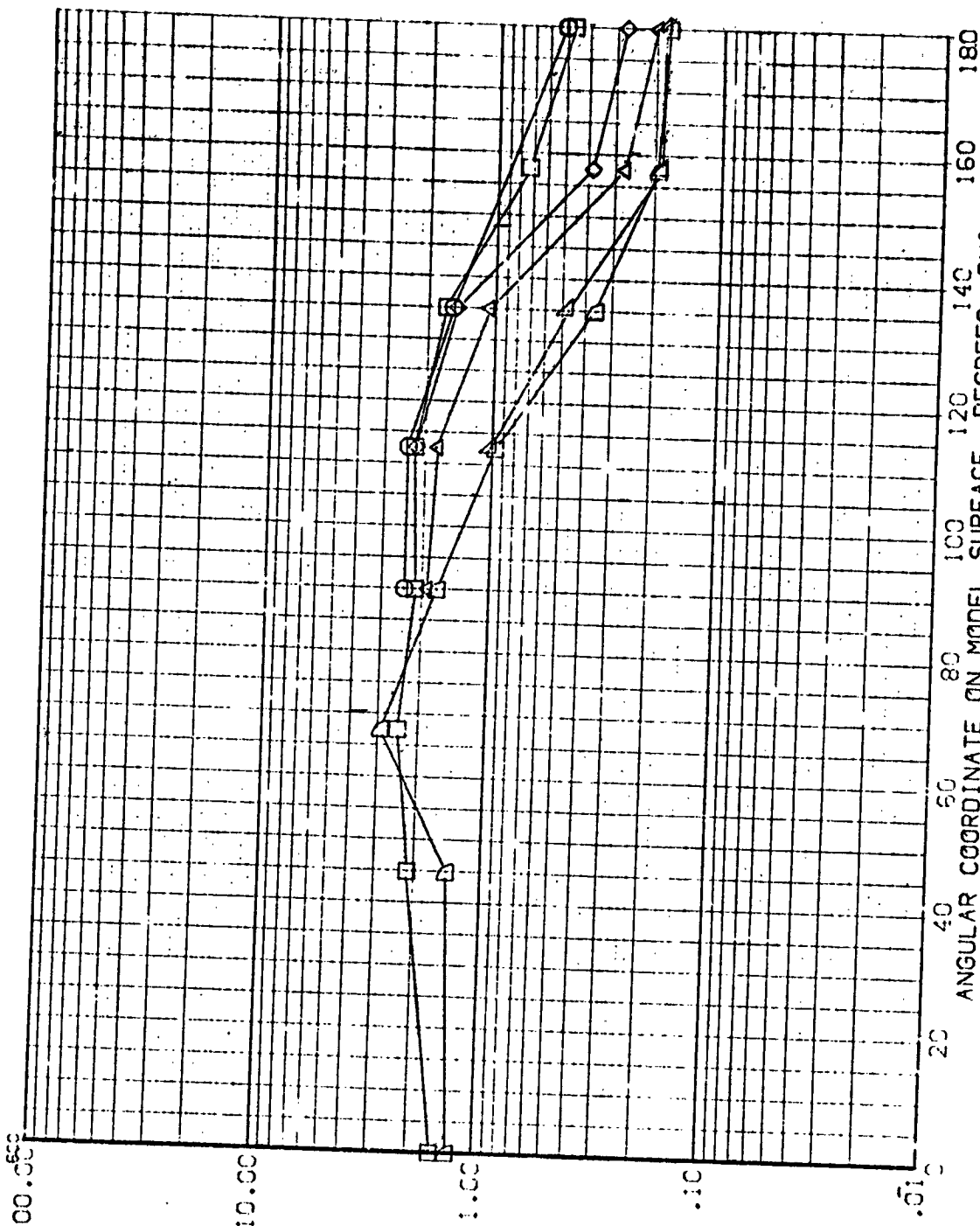


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT06)

SYMBOL K/L HAN/HT MACH  
 .650  
 .700  
 .750  
 .800  
 .850  
 .900

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA 1.000  
 RN/L .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

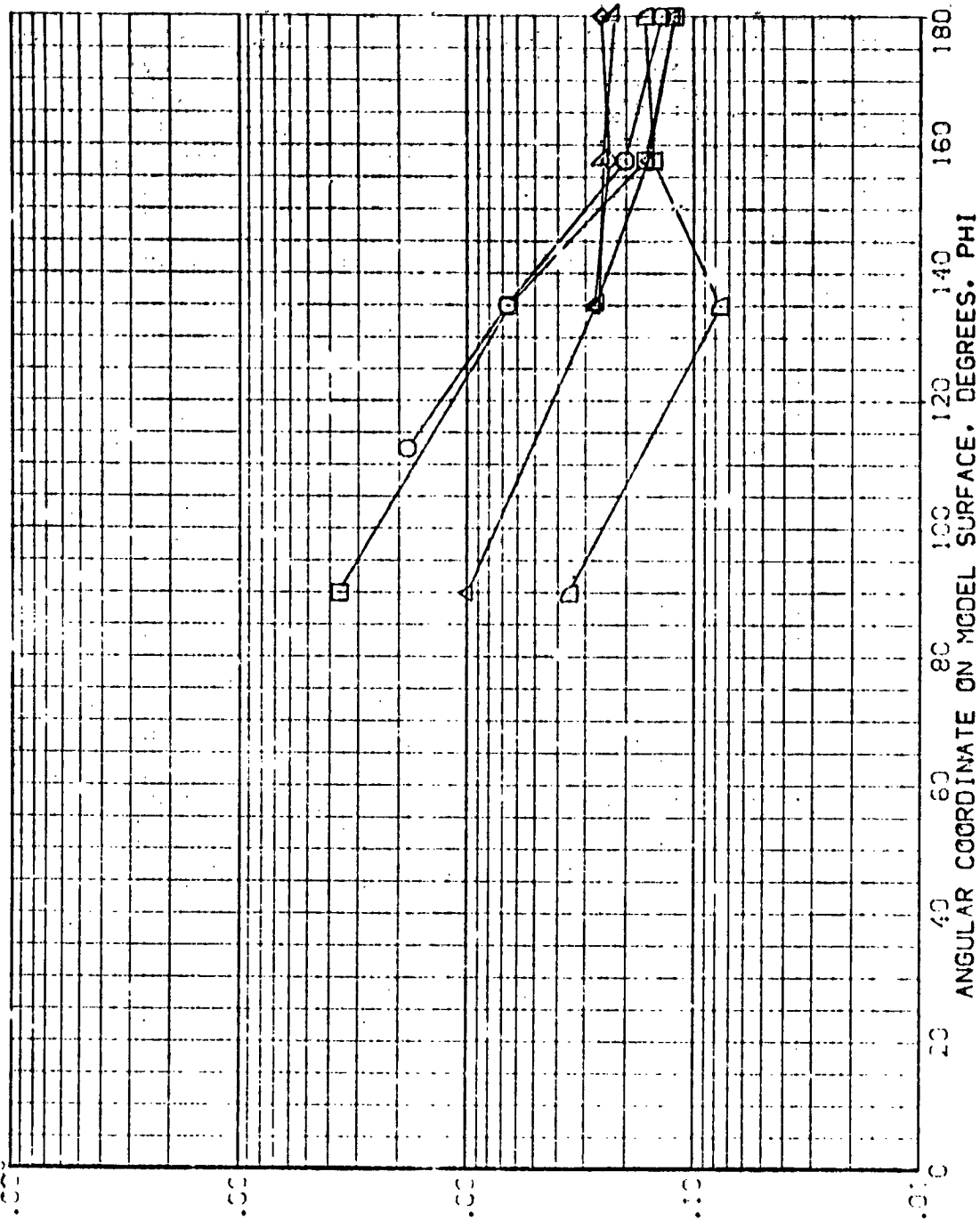


FIG. 6 TANK. RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-.95 IH23 01+T1 EXTERNAL TANK

(BEVT07)

PARAMETRIC VALUES  
ALPHA -90.000 BETA .000  
RML/L 1.000

WAVELENGTH X/L .350  
WAVELENGTH X/L .400  
WAVELENGTH X/L .450  
WAVELENGTH X/L .500  
WAVELENGTH X/L .550  
WAVELENGTH X/L .600

WAVELENGTH X/L .650  
WAVELENGTH X/L .700  
WAVELENGTH X/L .750  
WAVELENGTH X/L .800  
WAVELENGTH X/L .850  
WAVELENGTH X/L .900  
WAVELENGTH X/L .950  
WAVELENGTH X/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

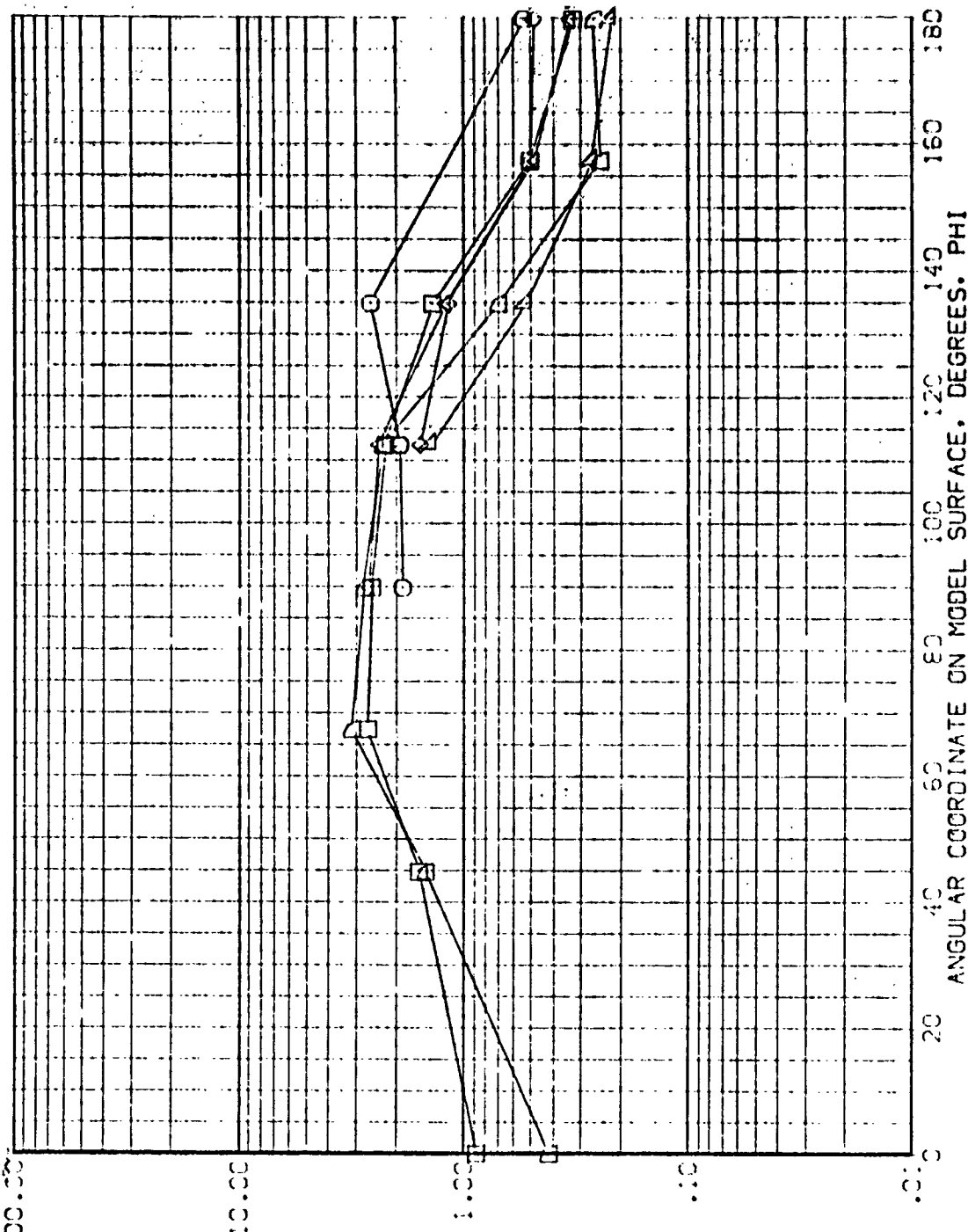


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 1H28 01-T1 EXTERNAL TANK

(BEVT07)

SYNTH. M/L .650  
HAF/HT .200 MACH 5.219

PARAMETRIC VALUES  
ALPHA .000 BETA .000  
PHI/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H/H_0$

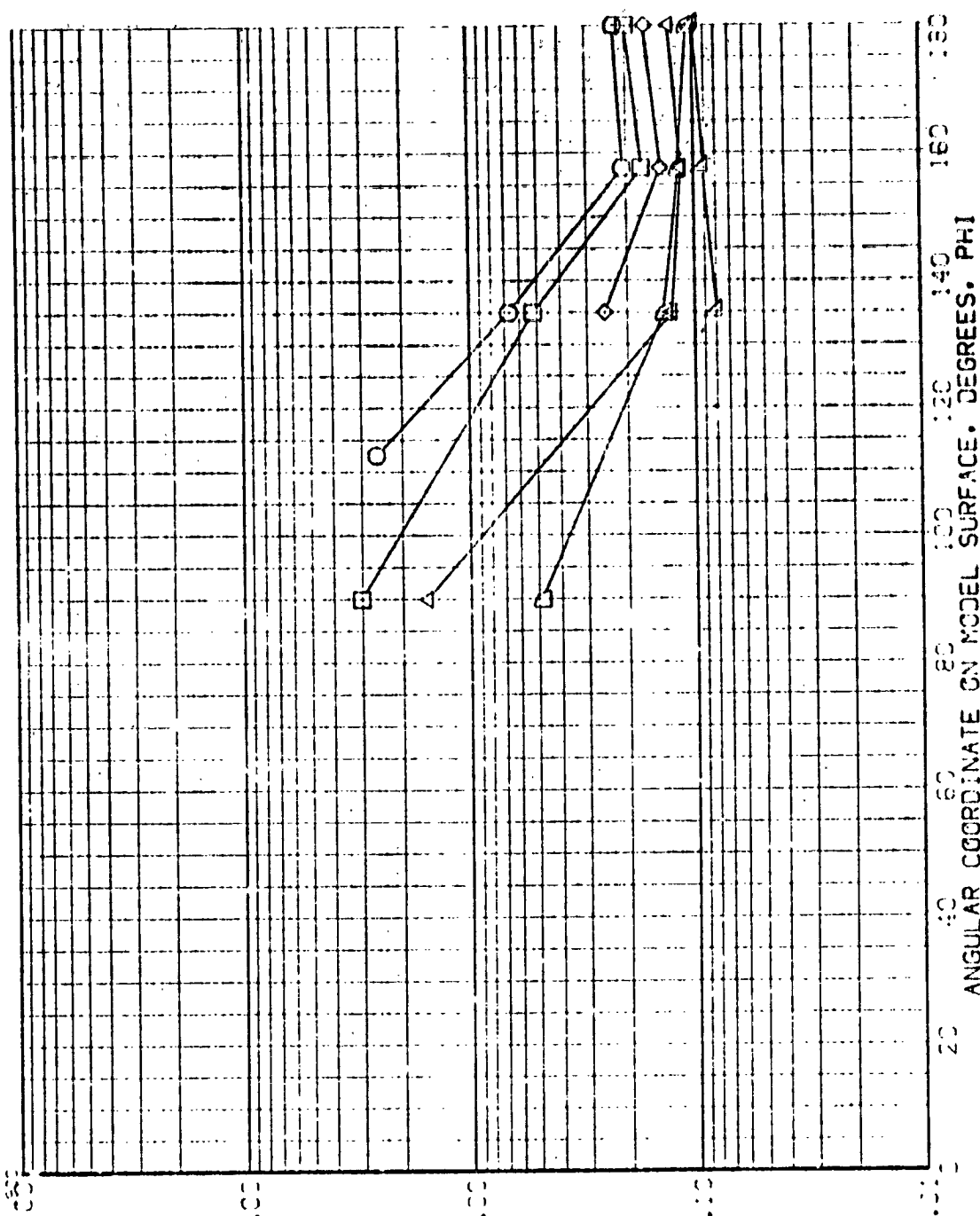


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-135 IH28 CI+T1 EXTERNAL TANK

(BEVT08)

PARAMETRIC VALUES  
ALPHA -60.000 BETA .000  
PM/L 1.000

WAVE X/L MAX/WT MACH  
.350 .500 .600 .700 .800 .900  
5.220

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

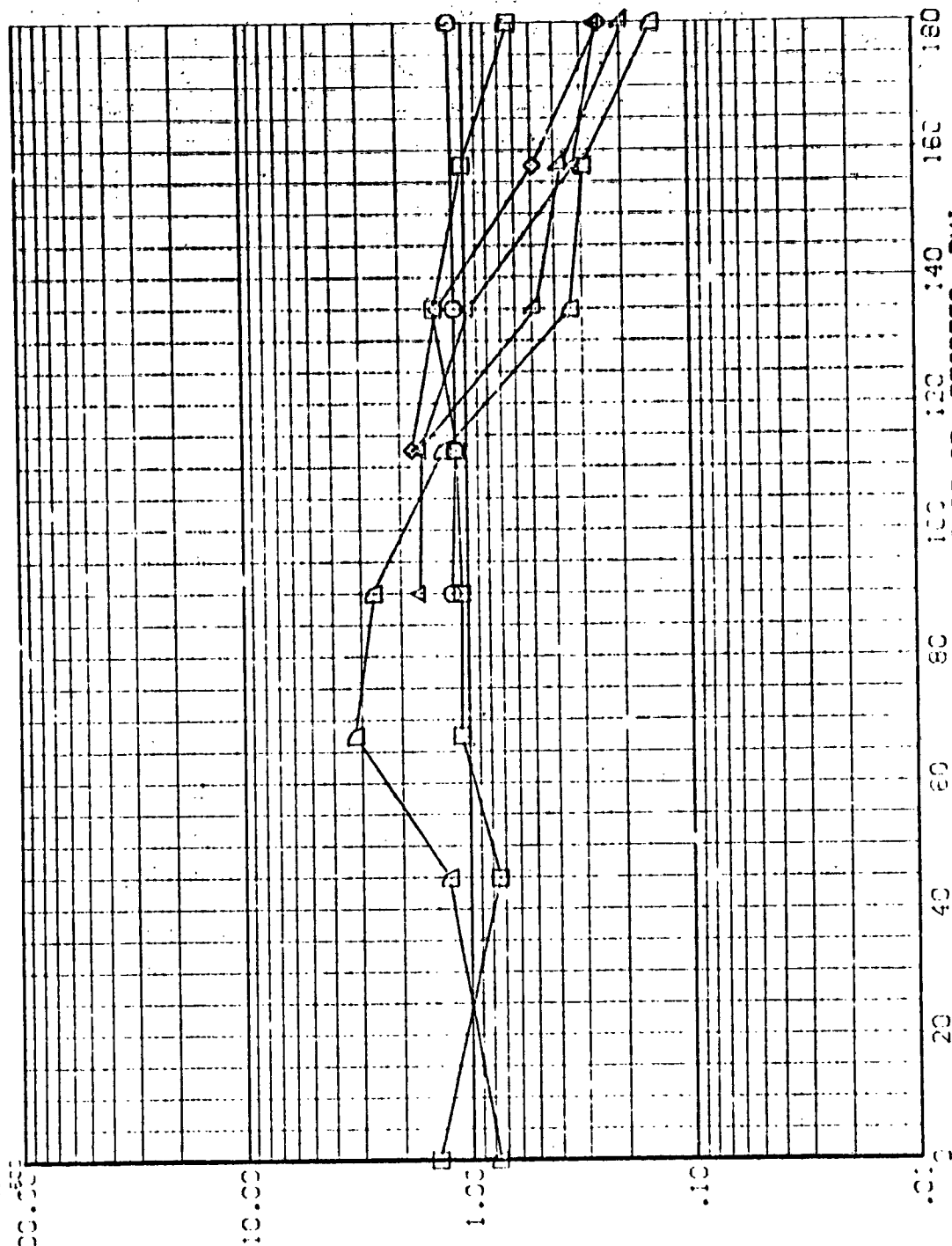


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

SYMBOL  
X/L  
.650  
.700  
.750  
.800  
.850  
.900  
.950  
1.000

MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
R/L  
-60.000  
1.000  
BETA  
1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

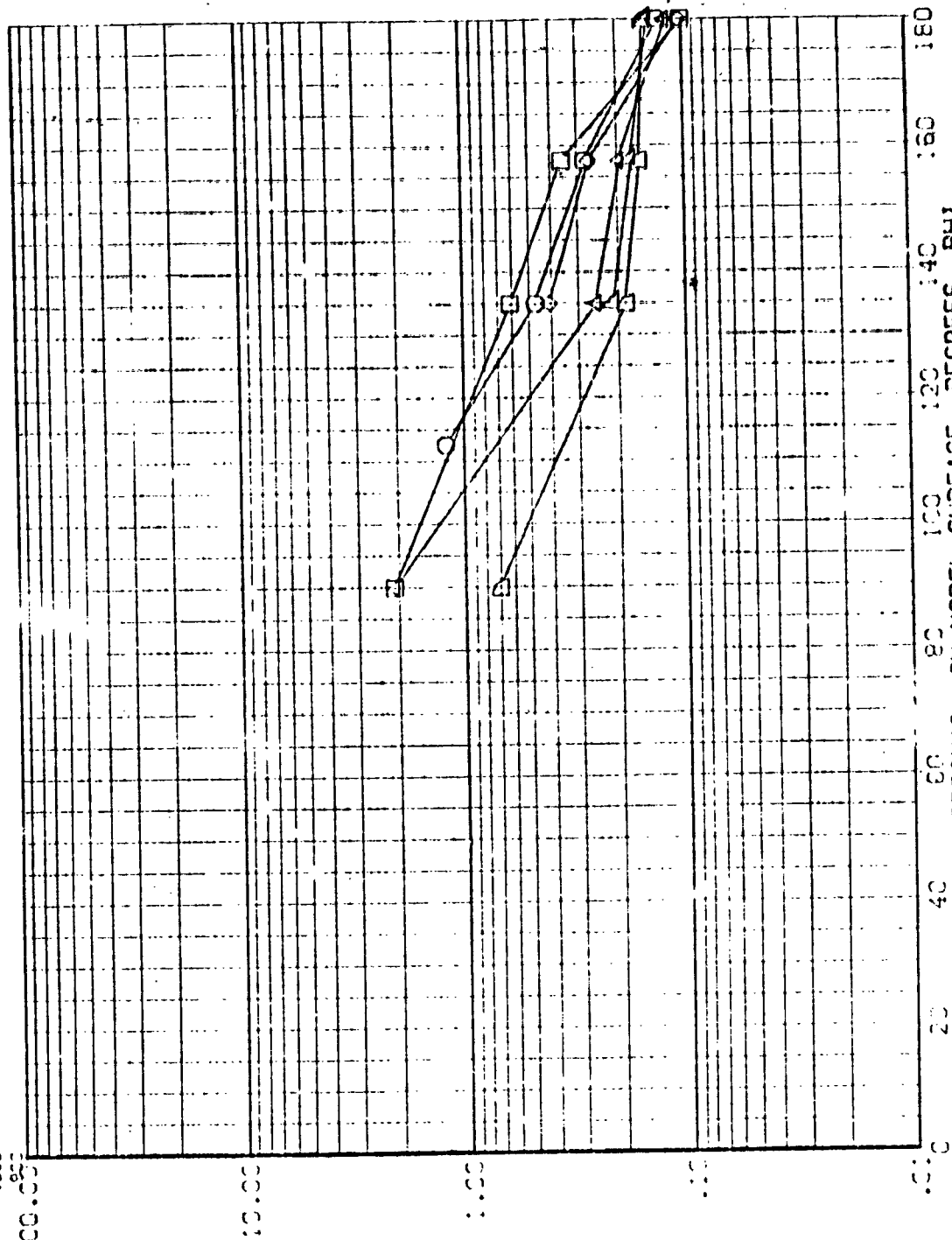


FIG. 6 TANK. RATIO OF INTERFERENCE TO UNDISTURBED

AXES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT09)

SYNCD XL  
 .350  
 .400  
 .450  
 .500  
 .550  
 .600  
 100.00

MACH  
 .900 5.219

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 .000  
 1.000  
 .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

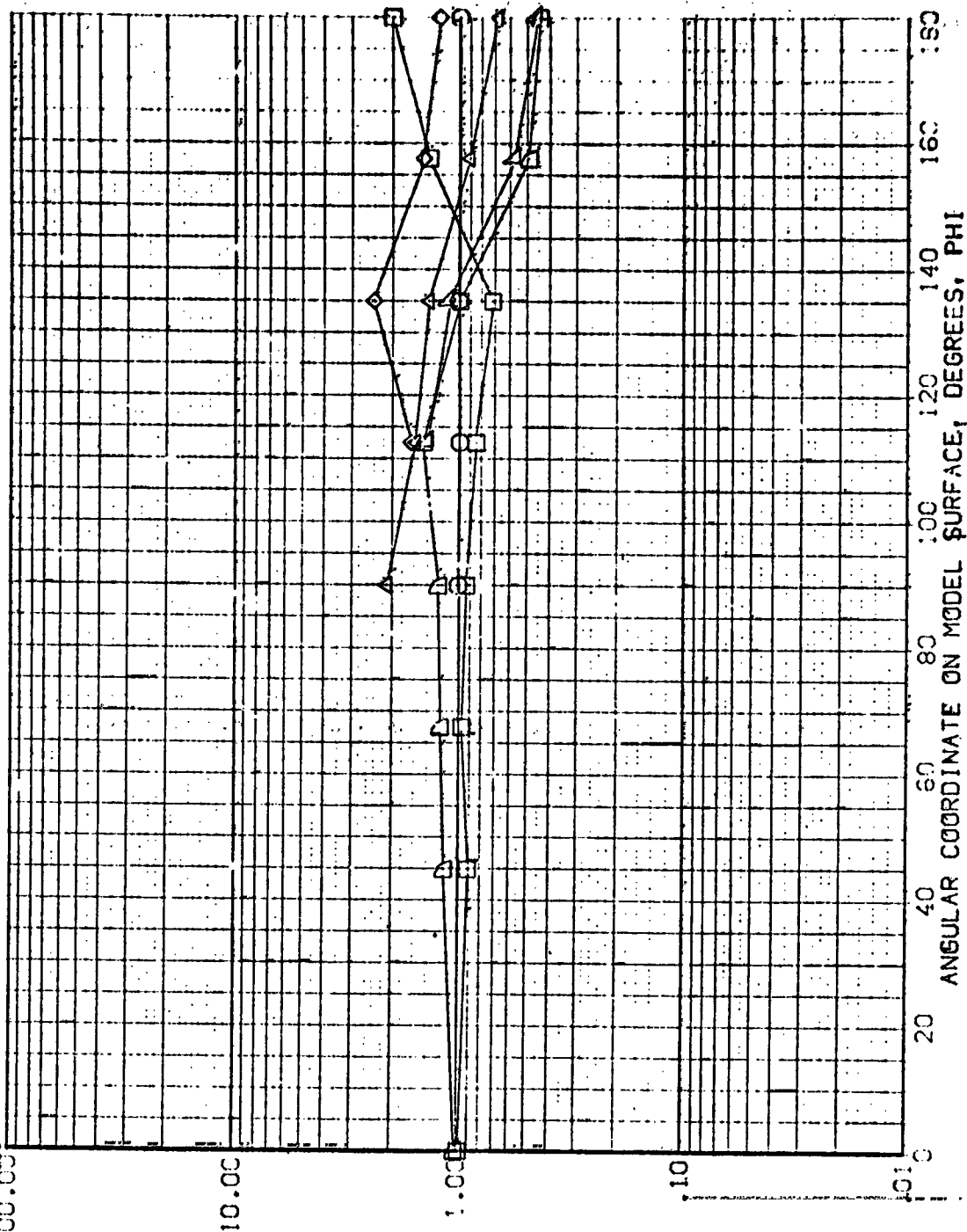


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 EXTERNAL TANK

(BEVT09)

SYMBOL X/L HAW/HT MACH  
 □ .650  
 □ .700  
 □ .750  
 □ .800  
 □ .850  
 □ .900

PARAMETRIC VALUES  
 ALPHA -30.000  
 R/L 1.000  
 BETA .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

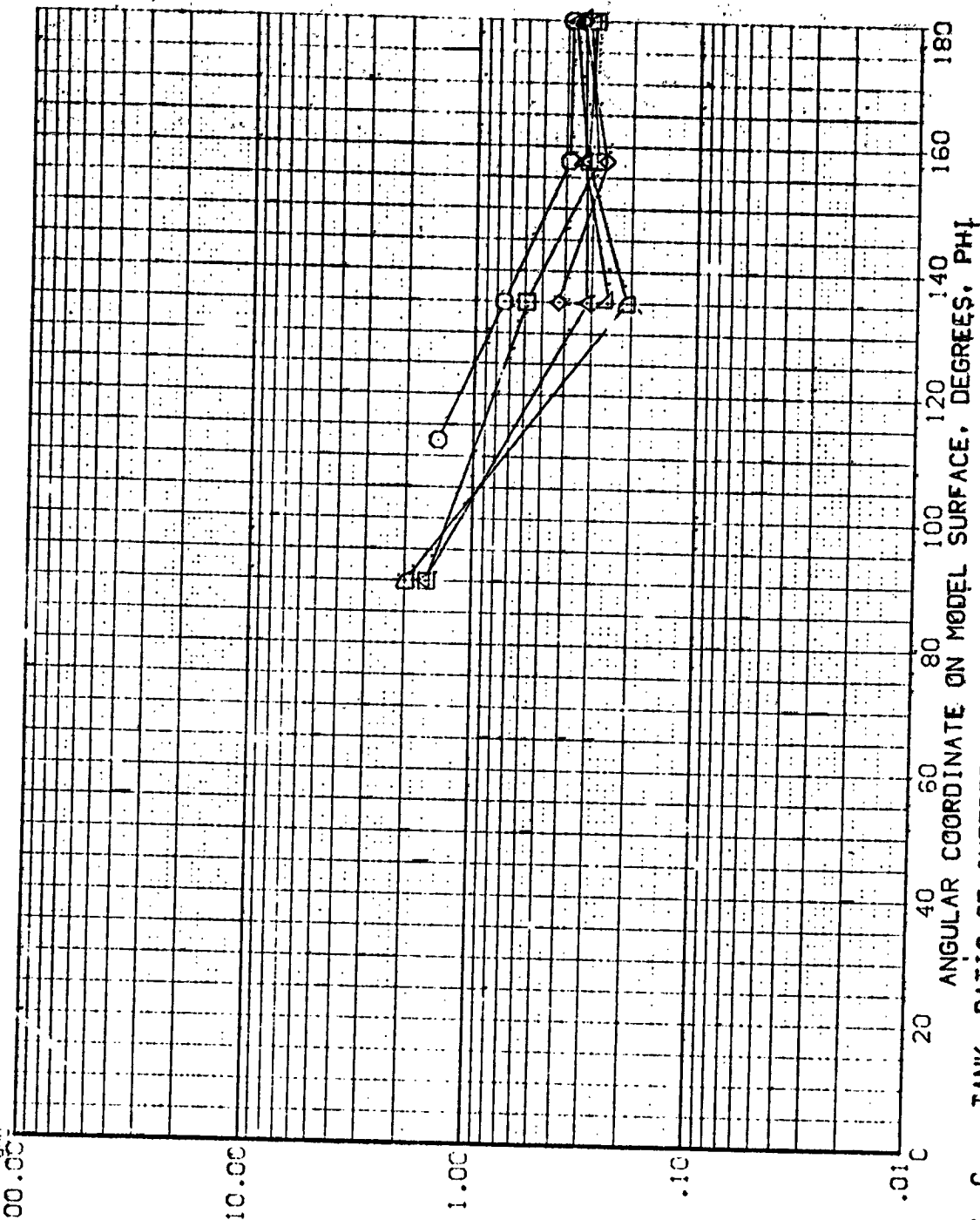


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED



DATA SET SYMBOL CONFIGURATION DESCRIPTION

AVES 3.5-195 1428 01471 EXTERNAL TANK  
 AVES 3.5-195 1428 01471 EXTERNAL TANK  
 AVES 3.5-195 1428 01471 EXTERNAL TANK  
 AVES 3.5-195 1428 01471 EXTERNAL TANK

ALPHA BETA RN/L  
 .000 .000 1.000  
 -120.000 .000 1.000  
 -90.000 .000 1.000  
 -60.000 .000 1.000  
 -30.000 .000 1.000

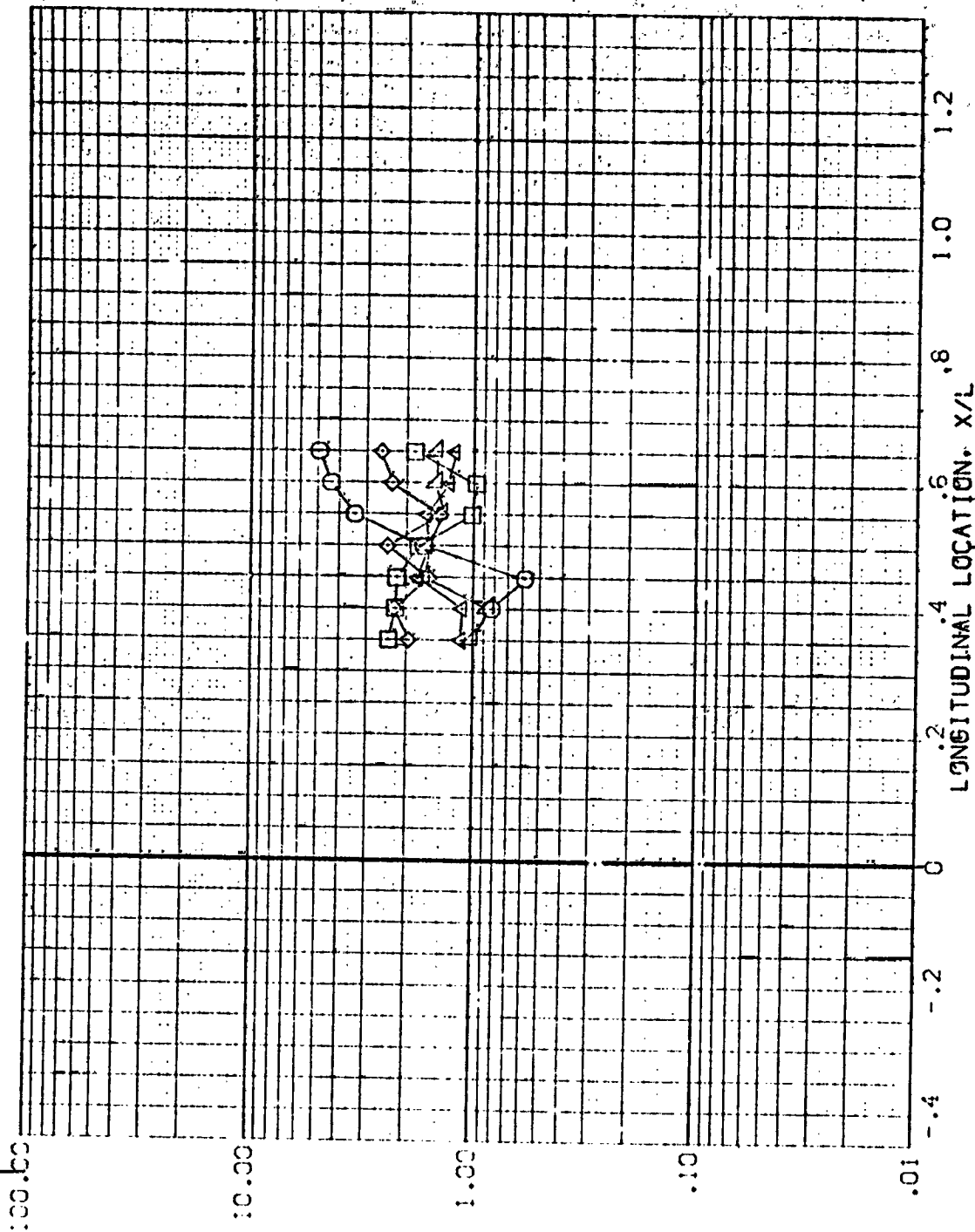


FIG. 6. TANK, RATIO OF INTERFERENCE TO UNDISTURBED

$\frac{HI}{HU} = 5.300$   $\frac{HAW}{HT} = .900$   $\phi = 112.500$

DATA SET SAVED: 40004

CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
AVES 3.5-1.25 1.28 CI+TI EXTERNAL TANK	.000	.000	1.000
AVES 3.5-1.25 1.28 CI+TI EXTERNAL TANK	-120.000	.000	1.000
AVES 3.5-1.25 1.28 CI+TI EXTERNAL TANK	-90.000	.000	1.000
AVES 3.5-1.25 1.28 CI+TI EXTERNAL TANK	-60.000	.000	1.000
AVES 3.5-1.25 1.28 CI+TI EXTERNAL TANK	-30.000	.000	1.000

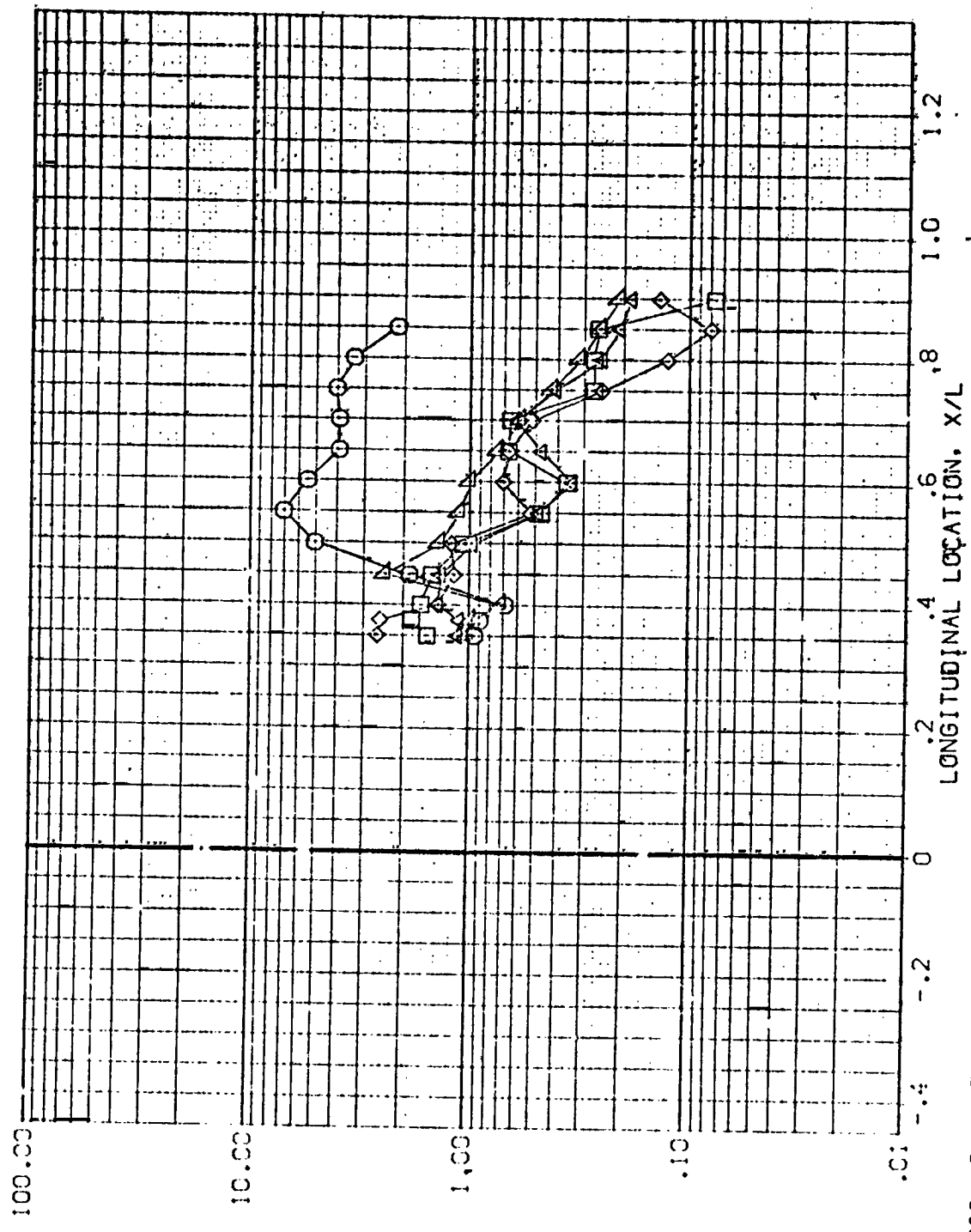


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P) (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z) (AA) (AB) (AC) (AD) (AE) (AF) (AG) (AH) (AI) (AJ) (AK) (AL) (AM) (AN) (AO) (AP) (AQ) (AR) (AS) (AT) (AU) (AV) (AW) (AX) (AY) (AZ) (BA) (BB) (BC) (BD) (BE) (BF) (BG) (BH) (BI) (BJ) (BK) (BL) (BM) (BN) (BO) (BP) (BQ) (BR) (BS) (BT) (BU) (BV) (BW) (BX) (BY) (BZ) (CA) (CB) (CC) (CD) (CE) (CF) (CG) (CH) (CI) (CJ) (CK) (CL) (CM) (CN) (CO) (CP) (CQ) (CR) (CS) (CT) (CU) (CV) (CW) (CX) (CY) (CZ) (DA) (DB) (DC) (DD) (DE) (DF) (DG) (DH) (DI) (DJ) (DK) (DL) (DM) (DN) (DO) (DP) (DQ) (DR) (DS) (DT) (DU) (DV) (DW) (DX) (DY) (DZ) (EA) (EB) (EC) (ED) (EE) (EF) (EG) (EH) (EI) (EJ) (EK) (EL) (EM) (EN) (EO) (EP) (EQ) (ER) (ES) (ET) (EU) (EV) (EW) (EX) (EY) (EZ) (FA) (FB) (FC) (FD) (FE) (FF) (FG) (FH) (FI) (FJ) (FK) (FL) (FM) (FN) (FO) (FP) (FQ) (FR) (FS) (FT) (FU) (FV) (FW) (FX) (FY) (FZ) (GA) (GB) (GC) (GD) (GE) (GF) (GG) (GH) (GI) (GJ) (GK) (GL) (GM) (GN) (GO) (GP) (GQ) (GR) (GS) (GT) (GU) (GV) (GW) (GX) (GY) (GZ) (HA) (HB) (HC) (HD) (HE) (HF) (HG) (HH) (HI) (HJ) (HK) (HL) (HM) (HN) (HO) (HP) (HQ) (HR) (HS) (HT) (HU) (HV) (HW) (HX) (HY) (HZ) (IA) (IB) (IC) (ID) (IE) (IF) (IG) (IH) (II) (IJ) (IK) (IL) (IM) (IN) (IO) (IP) (IQ) (IR) (IS) (IT) (IU) (IV) (IW) (IX) (IY) (IZ) (JA) (JB) (JC) (JD) (JE) (JF) (JG) (JH) (JI) (JJ) (JK) (JL) (JM) (JN) (JO) (JP) (JQ) (JR) (JS) (JT) (JU) (JV) (JW) (JX) (JY) (JZ) (KA) (KB) (KC) (KD) (KE) (KF) (KG) (KH) (KI) (KJ) (KK) (KL) (KM) (KN) (KO) (KP) (KQ) (KR) (KS) (KT) (KU) (KV) (KW) (KX) (KY) (KZ) (LA) (LB) (LC) (LD) (LE) (LF) (LG) (LH) (LI) (LJ) (LK) (LL) (LM) (LN) (LO) (LP) (LQ) (LR) (LS) (LT) (LU) (LV) (LW) (LX) (LY) (LZ) (MA) (MB) (MC) (MD) (ME) (MF) (MG) (MH) (MI) (MJ) (MK) (ML) (MM) (MN) (MO) (MP) (MQ) (MR) (MS) (MT) (MU) (MV) (MW) (MX) (MY) (MZ) (NA) (NB) (NC) (ND) (NE) (NF) (NG) (NH) (NI) (NJ) (NK) (NL) (NM) (NN) (NO) (NP) (NQ) (NR) (NS) (NT) (NU) (NV) (NW) (NX) (NY) (NZ) (OA) (OB) (OC) (OD) (OE) (OF) (OG) (OH) (OI) (OJ) (OK) (OL) (OM) (ON) (OO) (OP) (OQ) (OR) (OS) (OT) (OU) (OV) (OW) (OX) (OY) (OZ) (PA) (PB) (PC) (PD) (PE) (PF) (PG) (PH) (PI) (PJ) (PK) (PL) (PM) (PN) (PO) (PP) (PQ) (PR) (PS) (PT) (PU) (PV) (PW) (PX) (PY) (PZ) (QA) (QB) (QC) (QD) (QE) (QF) (QG) (QH) (QI) (QJ) (QK) (QL) (QM) (QN) (QO) (QP) (QQ) (QR) (QS) (QT) (QU) (QV) (QW) (QX) (QY) (QZ) (RA) (RB) (RC) (RD) (RE) (RF) (RG) (RH) (RI) (RJ) (RK) (RL) (RM) (RN) (RO) (RP) (RQ) (RR) (RS) (RT) (RU) (RV) (RW) (RX) (RY) (RZ) (SA) (SB) (SC) (SD) (SE) (SF) (SG) (SH) (SI) (SJ) (SK) (SL) (SM) (SN) (SO) (SP) (SQ) (SR) (SS) (ST) (SU) (SV) (SW) (SX) (SY) (SZ) (TA) (TB) (TC) (TD) (TE) (TF) (TG) (TH) (TI) (TJ) (TK) (TL) (TM) (TN) (TO) (TP) (TQ) (TR) (TS) (TT) (TU) (TV) (TW) (TX) (TY) (TZ) (UA) (UB) (UC) (UD) (UE) (UF) (UG) (UH) (UI) (UJ) (UK) (UL) (UM) (UN) (UO) (UP) (UQ) (UR) (US) (UT) (UU) (UV) (UW) (UX) (UY) (UZ) (VA) (VB) (VC) (VD) (VE) (VF) (VG) (VH) (VI) (VJ) (VK) (VL) (VM) (VN) (VO) (VP) (VQ) (VR) (VS) (VT) (VU) (VV) (VW) (VX) (VY) (VZ) (WA) (WB) (WC) (WD) (WE) (WF) (WG) (WH) (WI) (WJ) (WK) (WL) (WM) (WN) (WO) (WP) (WQ) (WR) (WS) (WT) (WU) (WV) (WW) (WX) (WY) (WZ) (XA) (XB) (XC) (XD) (XE) (XF) (XG) (XH) (XI) (XJ) (XK) (XL) (XM) (XN) (XO) (XP) (XQ) (XR) (XS) (XT) (XU) (XV) (XW) (XX) (XY) (XZ) (YA) (YB) (YC) (YD) (YE) (YF) (YG) (YH) (YI) (YJ) (YK) (YL) (YM) (YN) (YO) (YP) (YQ) (YR) (YS) (YT) (YU) (YV) (YW) (YX) (YZ) (ZA) (ZB) (ZC) (ZD) (ZE) (ZF) (ZG) (ZH) (ZI) (ZJ) (ZK) (ZL) (ZM) (ZN) (ZO) (ZP) (ZQ) (ZR) (ZS) (ZT) (ZU) (ZV) (ZW) (ZX) (ZY) (ZZ)

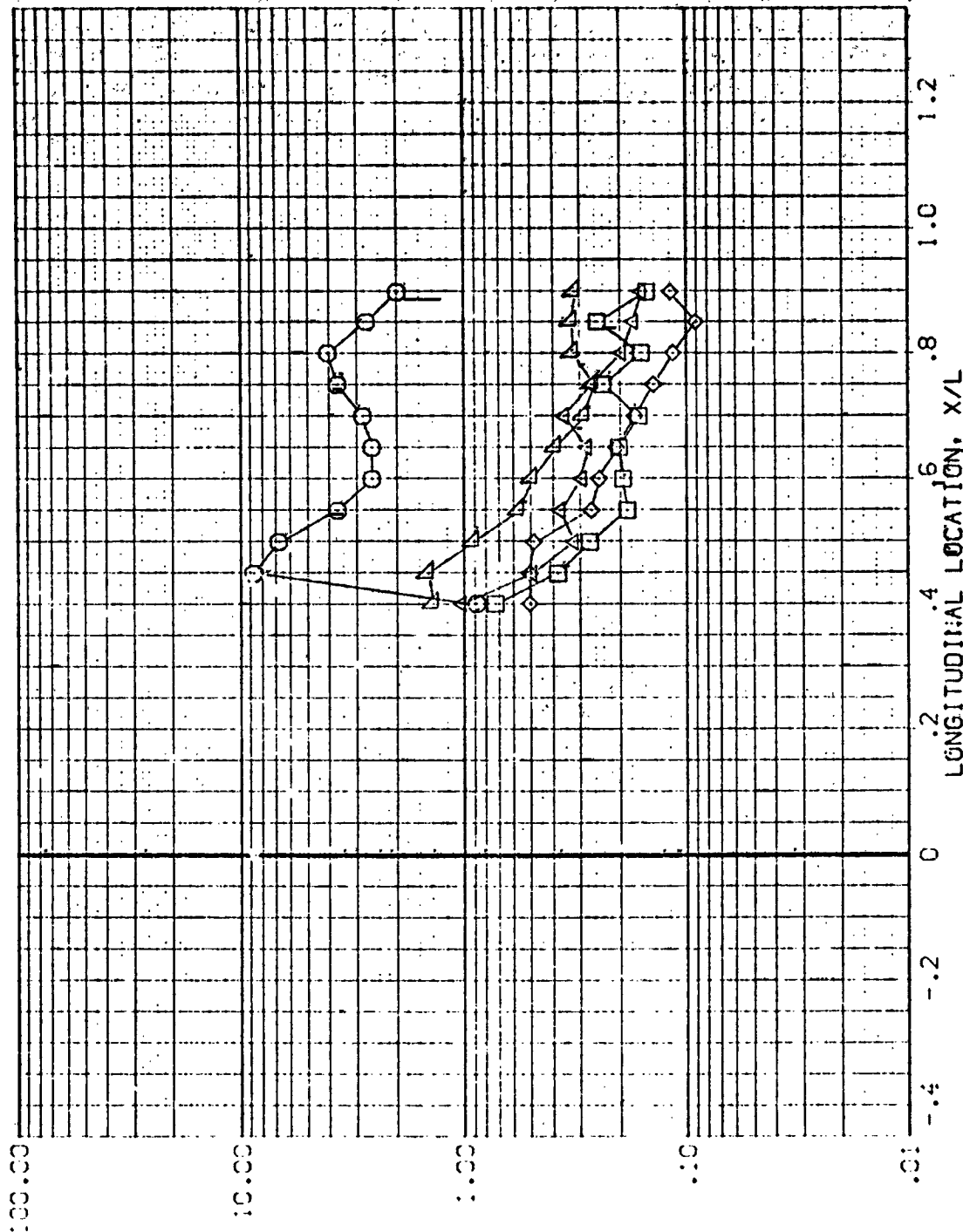


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

DATA SET SVSCL CONVECTION DESCRIPTION ALPHA BETA  $\rho V/L$

1	1.0000	0.000	1.000
2	1.0000	0.000	1.000
3	1.0000	0.000	1.000
4	1.0000	0.000	1.000
5	1.0000	0.000	1.000
6	1.0000	0.000	1.000
7	1.0000	0.000	1.000
8	1.0000	0.000	1.000
9	1.0000	0.000	1.000
10	1.0000	0.000	1.000
11	1.0000	0.000	1.000
12	1.0000	0.000	1.000
13	1.0000	0.000	1.000
14	1.0000	0.000	1.000
15	1.0000	0.000	1.000
16	1.0000	0.000	1.000
17	1.0000	0.000	1.000
18	1.0000	0.000	1.000
19	1.0000	0.000	1.000
20	1.0000	0.000	1.000
21	1.0000	0.000	1.000
22	1.0000	0.000	1.000
23	1.0000	0.000	1.000
24	1.0000	0.000	1.000
25	1.0000	0.000	1.000
26	1.0000	0.000	1.000
27	1.0000	0.000	1.000
28	1.0000	0.000	1.000
29	1.0000	0.000	1.000
30	1.0000	0.000	1.000
31	1.0000	0.000	1.000
32	1.0000	0.000	1.000
33	1.0000	0.000	1.000
34	1.0000	0.000	1.000
35	1.0000	0.000	1.000
36	1.0000	0.000	1.000
37	1.0000	0.000	1.000
38	1.0000	0.000	1.000
39	1.0000	0.000	1.000
40	1.0000	0.000	1.000
41	1.0000	0.000	1.000
42	1.0000	0.000	1.000
43	1.0000	0.000	1.000
44	1.0000	0.000	1.000
45	1.0000	0.000	1.000
46	1.0000	0.000	1.000
47	1.0000	0.000	1.000
48	1.0000	0.000	1.000
49	1.0000	0.000	1.000
50	1.0000	0.000	1.000
51	1.0000	0.000	1.000
52	1.0000	0.000	1.000
53	1.0000	0.000	1.000
54	1.0000	0.000	1.000
55	1.0000	0.000	1.000
56	1.0000	0.000	1.000
57	1.0000	0.000	1.000
58	1.0000	0.000	1.000
59	1.0000	0.000	1.000
60	1.0000	0.000	1.000
61	1.0000	0.000	1.000
62	1.0000	0.000	1.000
63	1.0000	0.000	1.000
64	1.0000	0.000	1.000
65	1.0000	0.000	1.000
66	1.0000	0.000	1.000
67	1.0000	0.000	1.000
68	1.0000	0.000	1.000
69	1.0000	0.000	1.000
70	1.0000	0.000	1.000
71	1.0000	0.000	1.000
72	1.0000	0.000	1.000
73	1.0000	0.000	1.000
74	1.0000	0.000	1.000
75	1.0000	0.000	1.000
76	1.0000	0.000	1.000
77	1.0000	0.000	1.000
78	1.0000	0.000	1.000
79	1.0000	0.000	1.000
80	1.0000	0.000	1.000
81	1.0000	0.000	1.000
82	1.0000	0.000	1.000
83	1.0000	0.000	1.000
84	1.0000	0.000	1.000
85	1.0000	0.000	1.000
86	1.0000	0.000	1.000
87	1.0000	0.000	1.000
88	1.0000	0.000	1.000
89	1.0000	0.000	1.000
90	1.0000	0.000	1.000
91	1.0000	0.000	1.000
92	1.0000	0.000	1.000
93	1.0000	0.000	1.000
94	1.0000	0.000	1.000
95	1.0000	0.000	1.000
96	1.0000	0.000	1.000
97	1.0000	0.000	1.000
98	1.0000	0.000	1.000
99	1.0000	0.000	1.000
100	1.0000	0.000	1.000

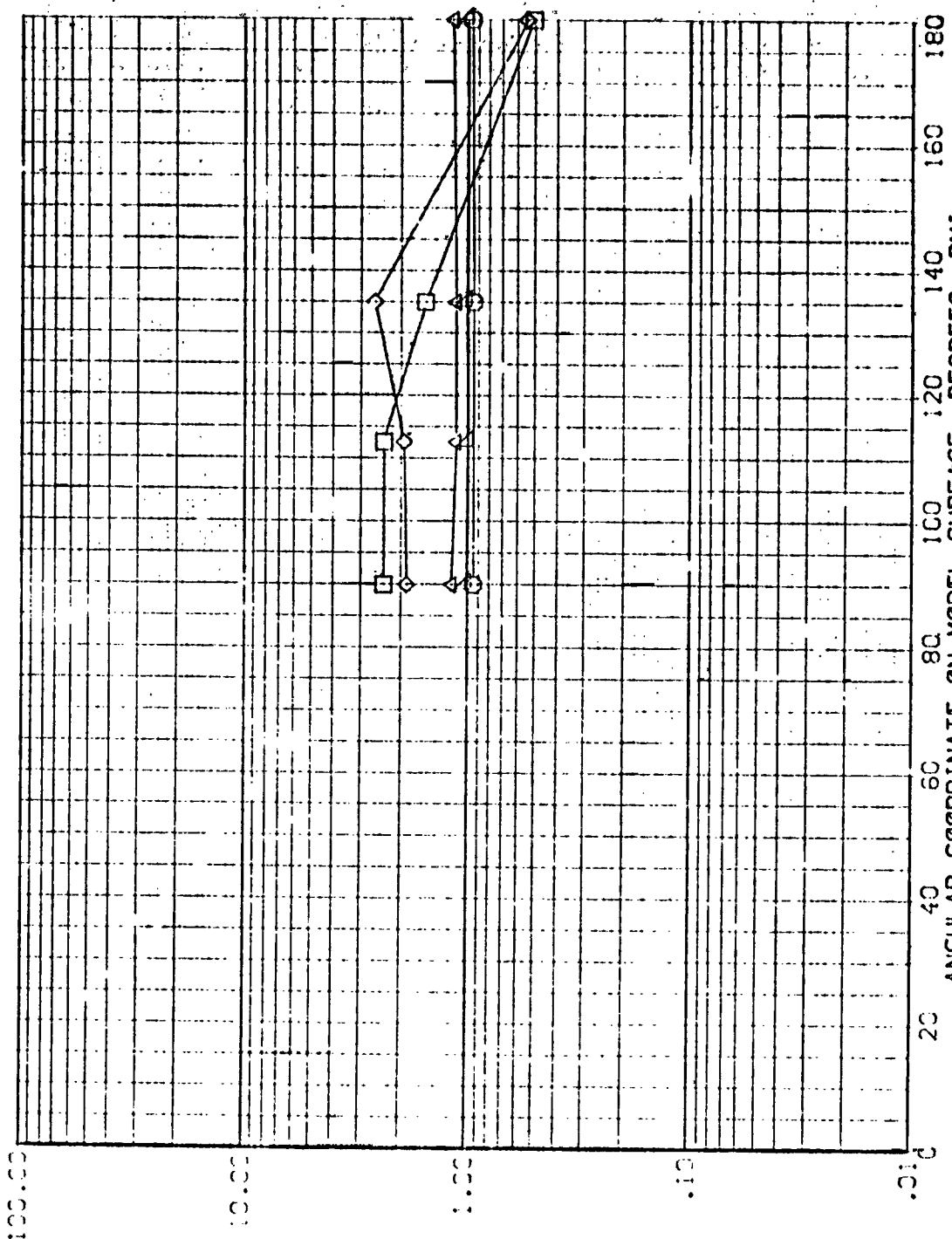


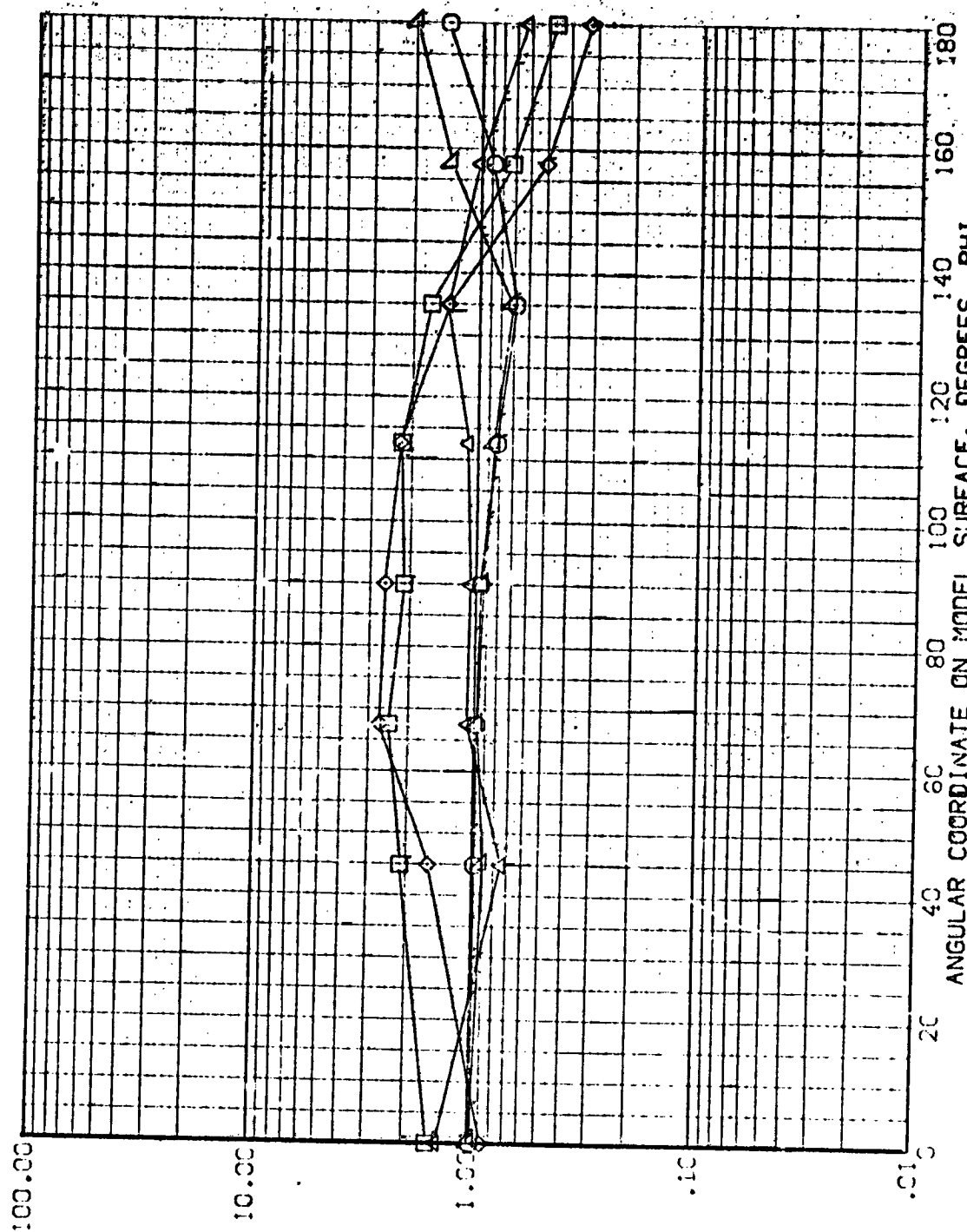
FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

5.300  $h_i/h_u = 1.50$

CRK-14

[illegible]

ALPHA	BETA	R <sup>2</sup> /L
.000	.000	1.000
-.120 .000	.000	1.000
-.90 .000	.000	1.000
-.60 .000	.000	1.000
-.30 .000	.000	1.000



ANGULAR COORDINATE ON MODEL SURFACE, DEGREES. PHI.

$$= \frac{5.300}{.900} \times \frac{1}{L} = .400$$



DATA SET SWB2L CONFIGURATION DESCRIPTION  
 ANG 3.5-1.95 128 01+11 EXTERNAL TANK  
 ANG 3.5-1.95 128 01+11 EXTERNAL TANK  
 ANG 3.5-1.95 128 01+11 EXTERNAL TANK  
 ANG 3.5-1.95 128 01+11 EXTERNAL TANK  
 ANG 3.5-1.95 128 01+11 EXTERNAL TANK

ALPHA BETA PHI/L  
 .000 .000 .000  
 -120.000 .000 .000  
 -90.000 .000 .000  
 -60.000 .000 .000  
 -30.000 .000 .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

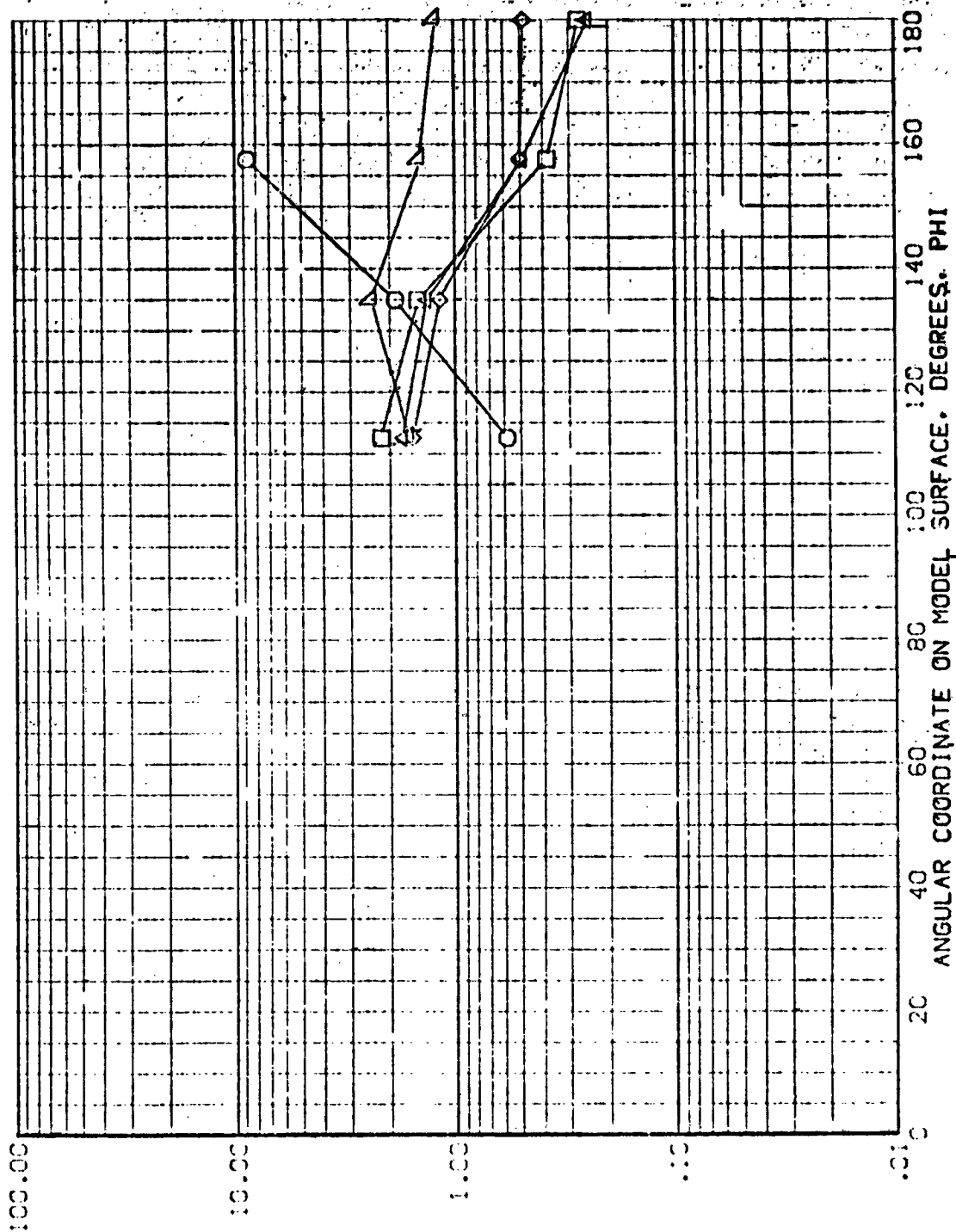


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

WAVELENGTH = 5.200 WAVELENGTH = .900 X/L = .450

ALPHA	BETA	RMSL
.000	.000	1.000
-120.000	.000	1.000
-90.000	.000	1.000
-60.000	.000	1.000
-30.000	.000	1.000

FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

$$5.300 - 1.400 = 3.900$$

[illegible]

ALPHA	BETA	PSY/L
.000	.000	1.000
-120.000	.000	1.000
-30.000	.000	1.000
-60.000	.000	1.000
-90.000	.000	1.000

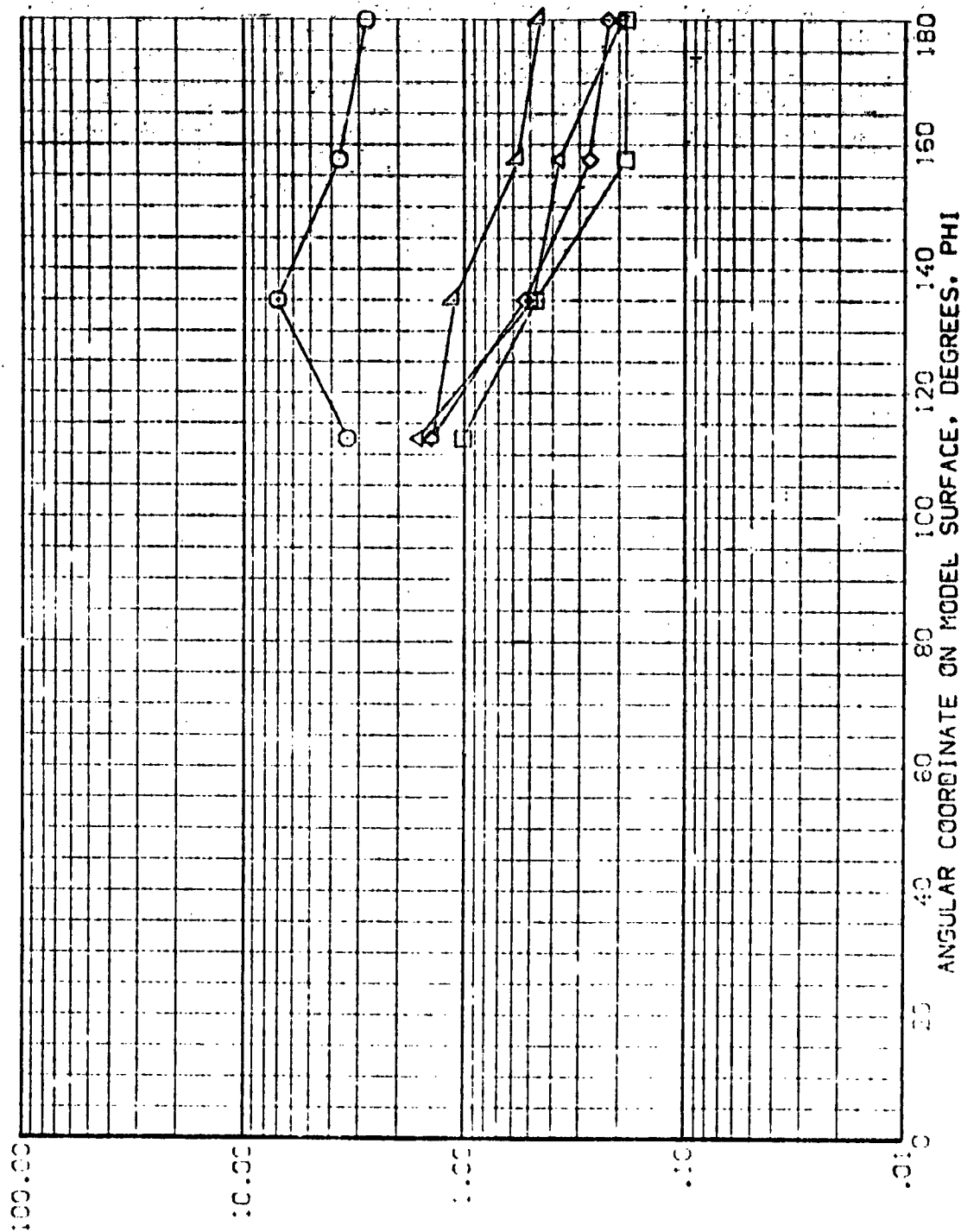


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

$$5.300 \text{ mm}^2/\text{m}^2 = .900 \text{ \%} = .550$$

SECRET

	ALPHA	BETA	RIV/L
0	.000	.000	1.000
1	.000	.000	1.000
2	.000	.000	1.000
3	.000	.000	1.000
4	.000	.000	1.000
5	.000	.000	1.000
6	.000	.000	1.000
7	.000	.000	1.000
8	.000	.000	1.000
9	.000	.000	1.000
10	.000	.000	1.000
11	.000	.000	1.000
12	.000	.000	1.000
13	.000	.000	1.000
14	.000	.000	1.000
15	.000	.000	1.000
16	.000	.000	1.000
17	.000	.000	1.000
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25	.000	.000	1.000
26	.000	.000	1.000
27	.000	.000	1.000
28	.000	.000	1.000
29	.000	.000	1.000
30	.000	.000	1.000
31	.000	.000	1.000
32	.000	.000	1.000
33	.000	.000	1.000
34	.000	.000	1.000
35	.000	.000	1.000
36	.000	.000	1.000
37	.000	.000	1.000
38	.000	.000	1.000
39	.000	.000	1.000
40	.000	.000	1.000
41	.000	.000	1.000
42	.000	.000	1.000
43	.000	.000	1.000
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45	.000	.000	1.000
46	.000	.000	1.000
47	.000	.000	1.000
48	.000	.000	1.000
49	.000	.000	1.000
50	.000	.000	1.000
51	.000	.000	1.000
52	.000	.000	1.000
53	.000	.000	1.000
54	.000	.000	1.000
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61	.000	.000	1.000
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64	.000	.000	1.000
65	.000	.000	1.000
66	.000	.000	1.000
67	.000	.000	1.000
68	.000	.000	1.000
69	.000	.000	1.000
70	.000	.000	1.000
71	.000	.000	1.000
72	.000	.000	1.000
73	.000	.000	1.000
74	.000	.000	1.000
75	.000	.000	1.000
76	.000	.000	1.000
77	.000	.000	1.000
78	.000	.000	1.000
79	.000	.000	1.000
80	.000	.000	1.000
81	.000	.000	1.000
82	.000	.000	1.000
83	.000	.000	1.000
84	.000	.000	1.000
85	.000	.000	1.000
86	.000	.000	1.000
87	.000	.000	1.000
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91	.000	.000	1.000
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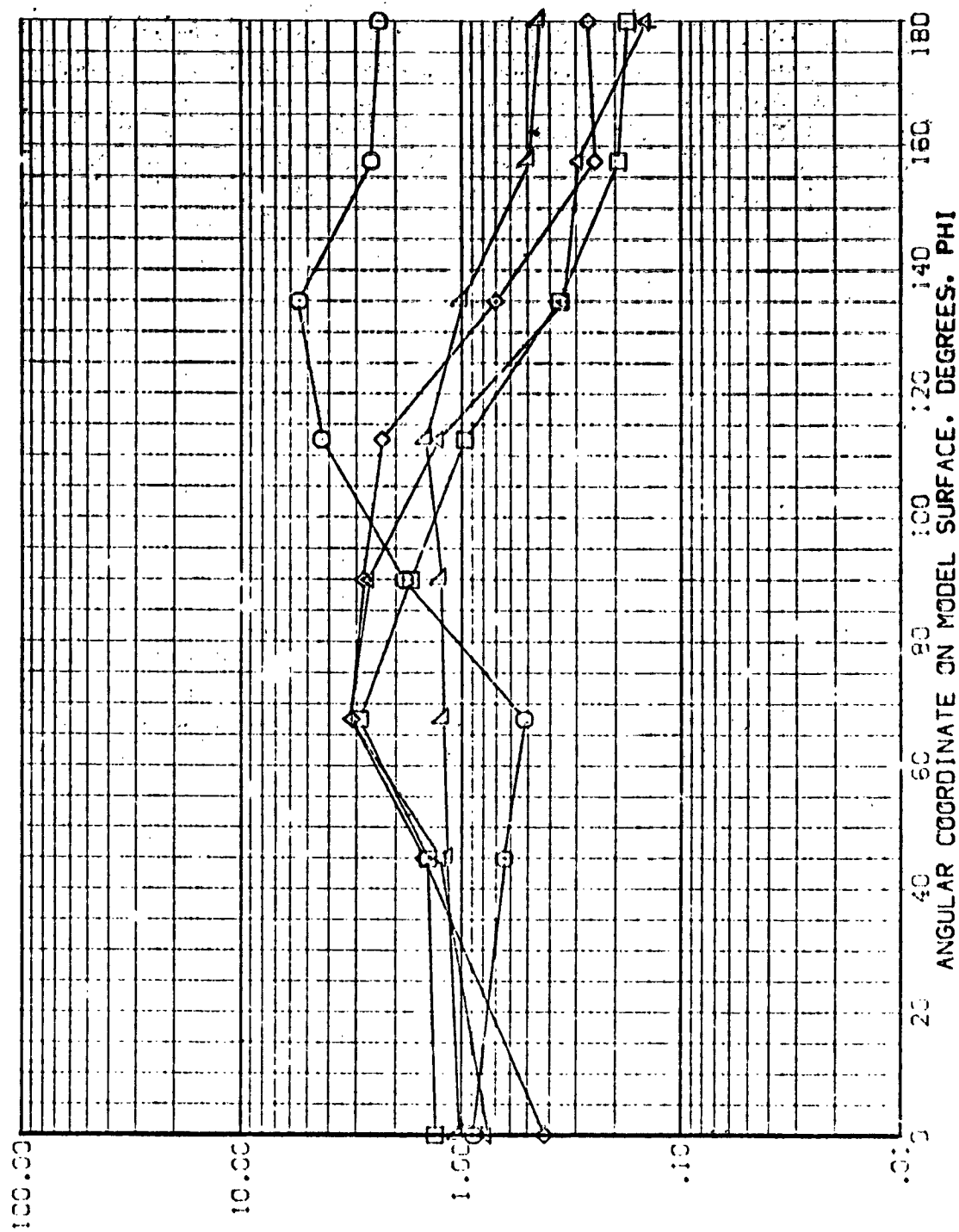


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

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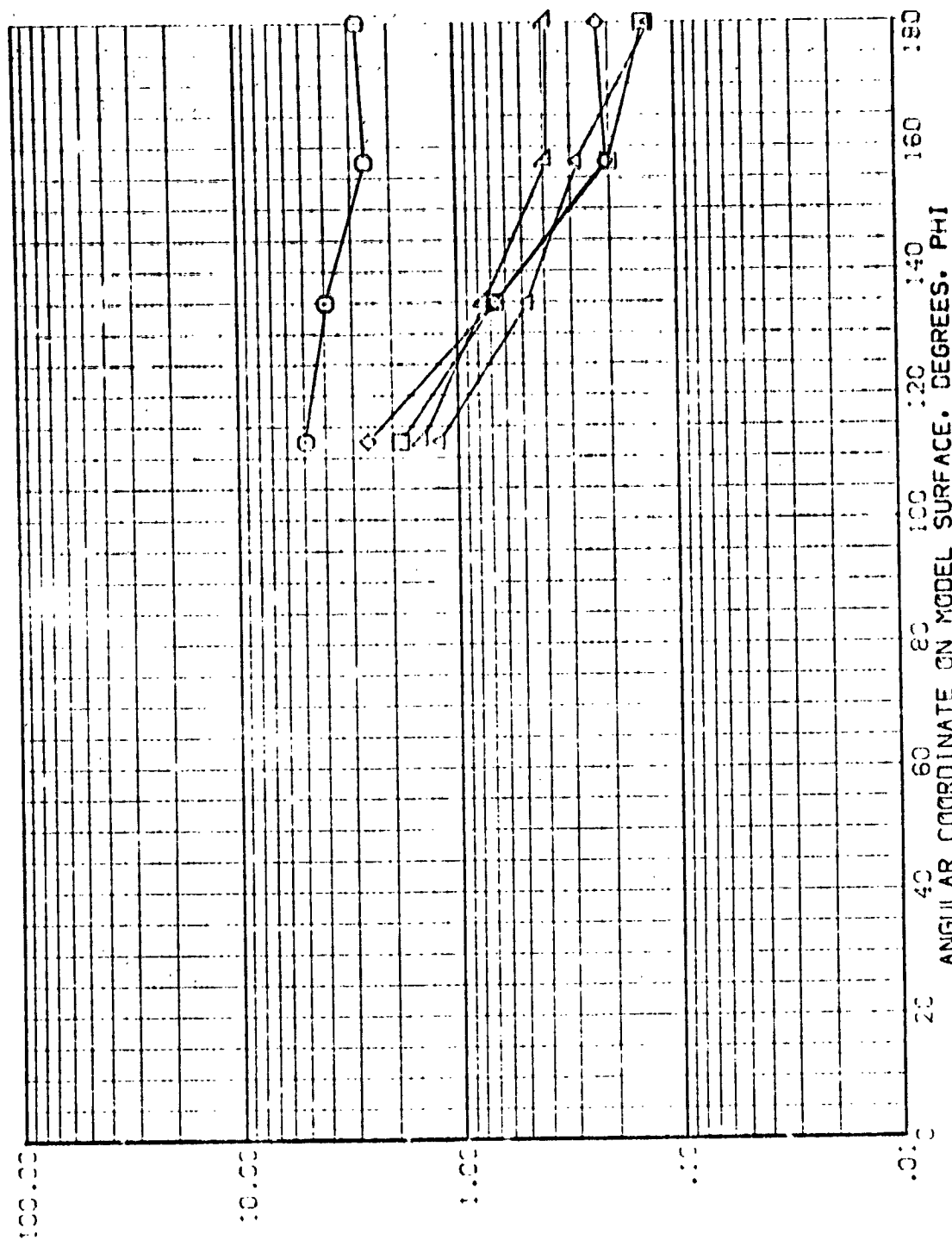


FIG. 6 TANK. RATIO OF INTERFERENCE TO UNDISTURBED

[illegible]

DATA SET 5222-  
(81-11-11)  
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CONFIGURATION DESCRIPTION  
AVES 3.5-135 1-28 CI+TI EXTERNAL TANK  
AVES 3.5-135 1-28 CI+TI EXTERNAL TANK  
AVES 3.5-135 1-28 CI+TI EXTERNAL TANK  
AVES 3.5-135 1-28 CI+TI EXTERNAL TANK  
AVES 3.5-135 1-28 CI+TI EXTERNAL TANK

ALPHA BETA PHI/L  
.000 .000 1.000  
-120.000 .000 1.000  
-90.000 .000 1.000  
-60.000 .000 1.000  
-30.000 .000 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

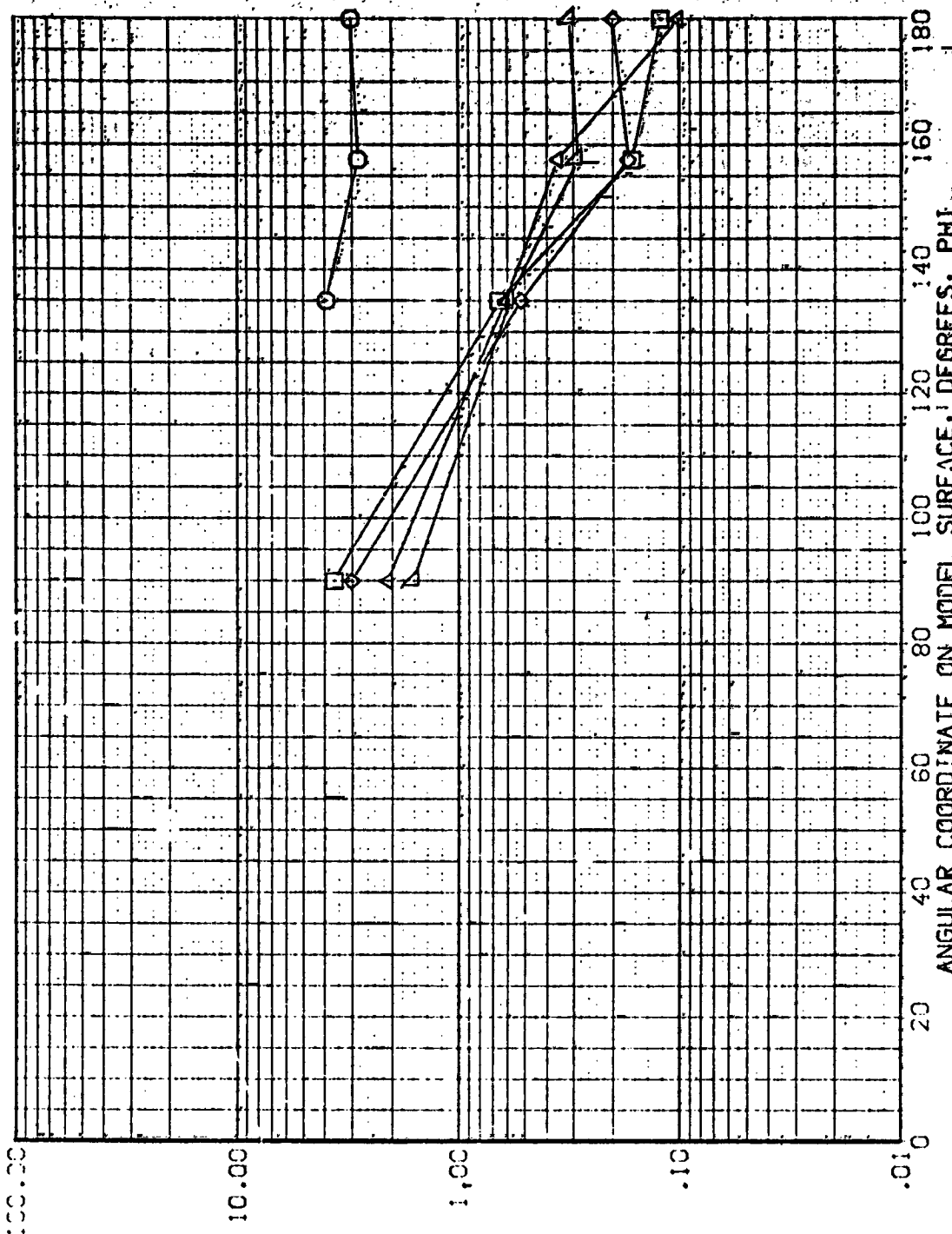


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

RATCH = 5.300 HAW/HT = .900 X/L = .700

DATA SET SYMBO. CONFIGURATION DESCRIPTION  
 (00000000) ASES 3-5-195 1428 01-11 EXTERNAL TANK  
 (00000000) ASES 3-5-195 1428 01-11 EXTERNAL TANK  
 (00000000) ASES 3-5-195 1428 01-11 EXTERNAL TANK  
 (00000000) ASES 3-5-195 1428 01-11 EXTERNAL TANK  
 (00000000) ASES 3-5-195 1428 01-11 EXTERNAL TANK

ALPHA BETA PN/L  
 .000 .000 1.000  
 -120.000 .000 1.000  
 -90.000 .000 1.000  
 -60.000 .000 1.000  
 -30.000 .000 1.000

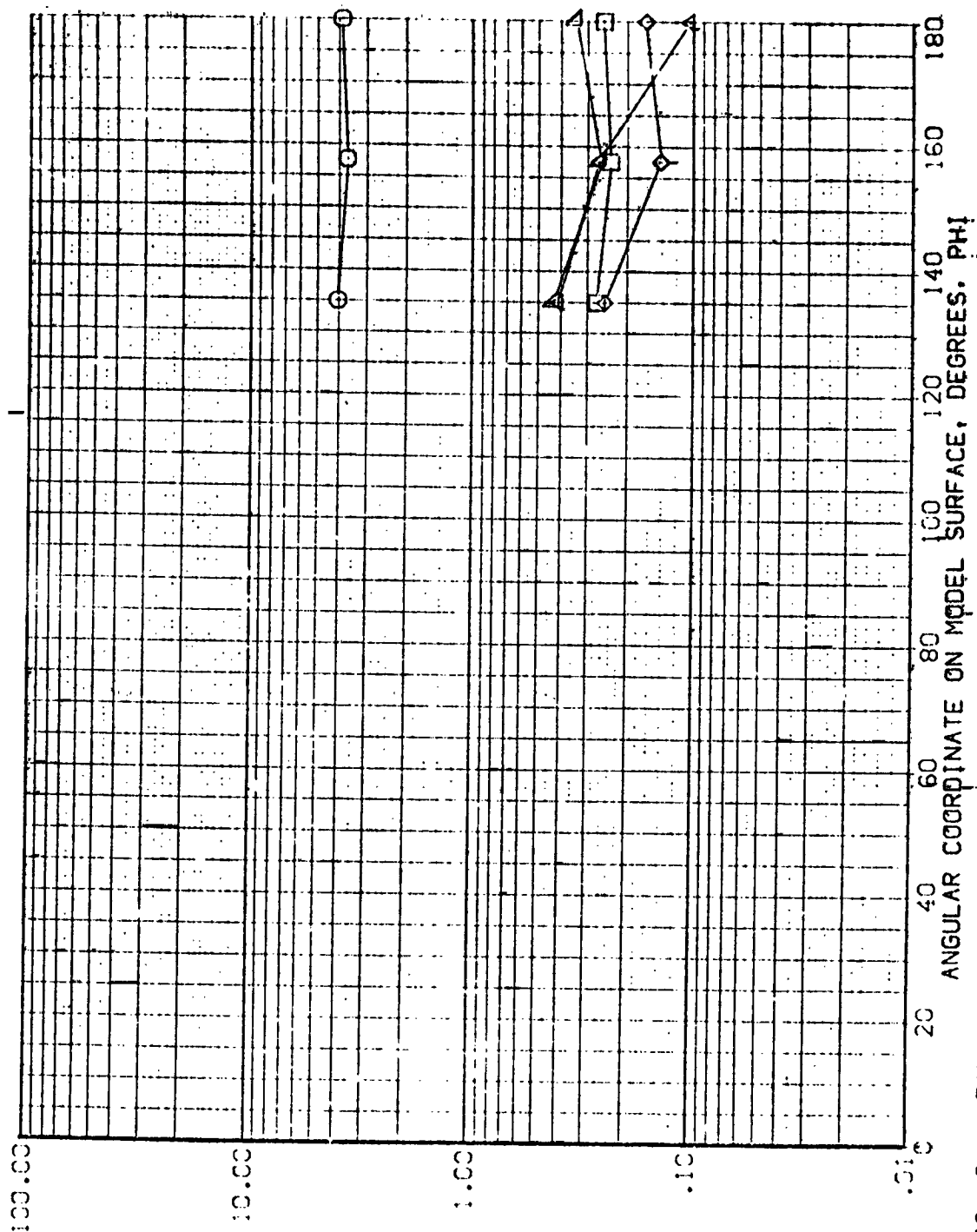


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

ALPHA BETA PN/L  
 .000 .000 1.000  
 -120.000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -30.000 .000 1.000

CONFIGURATION DESCRIPTION  
 A35 3.5-135 H28 01411 EXTERNAL TANK  
 A35 3.5-135 H28 01411 EXTERNAL TANK  
 A35 3.5-135 H28 01411 EXTERNAL TANK  
 A35 3.5-135 H28 01411 EXTERNAL TANK  
 A35 3.5-135 H28 01411 EXTERNAL TANK

DATA SET SYMBOL  
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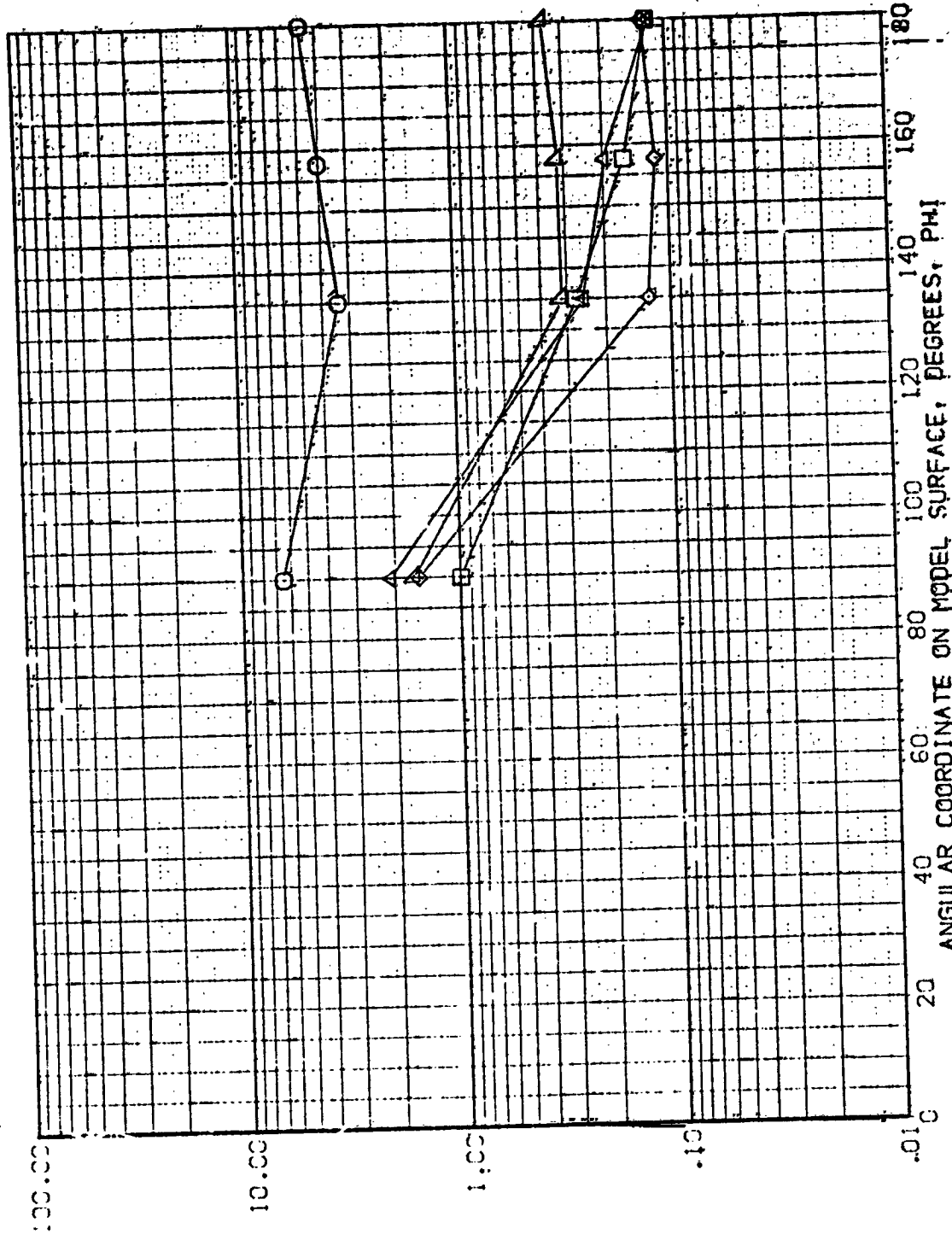


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU  
 EACH = 5.300 HAW/HT = .800 X/L = .800



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
(SERV101)	AVES 3.5-195 IH28 CI+TI EXTERNAL TANK	.000	.000	1.000
(SERV102)	AVES 3.5-195 IH28 CI+TI EXTERNAL TANK	-120.000	.000	1.000
(SERV103)	AVES 3.5-195 IH28 CI+TI EXTERNAL TANK	-90.000	.000	1.000
(SERV104)	AVES 3.5-195 IH28 CI+TI EXTERNAL TANK	-60.000	.000	1.000
(SERV105)	AVES 3.5-195 IH28 CI+TI EXTERNAL TANK	-30.000	.000	1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

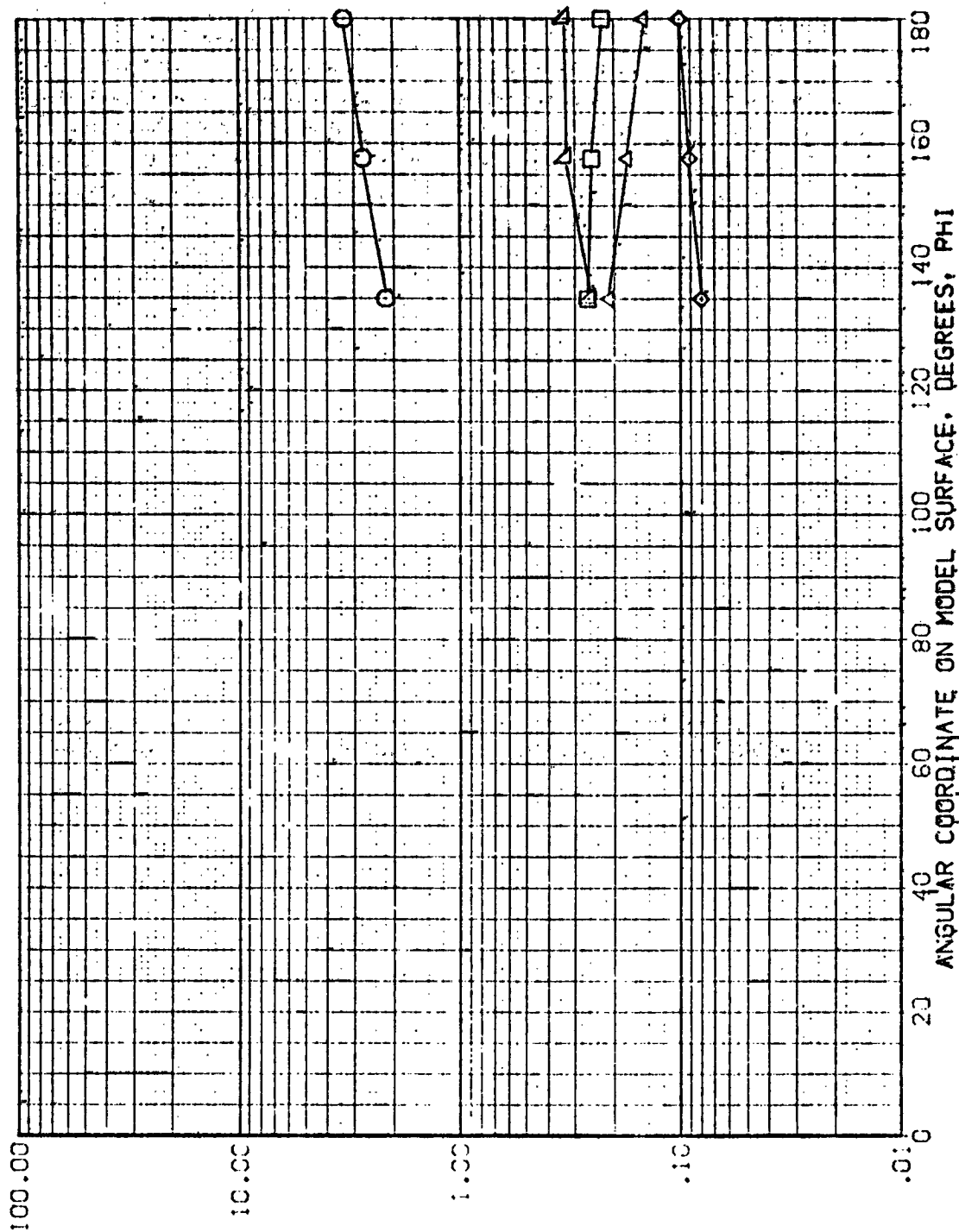
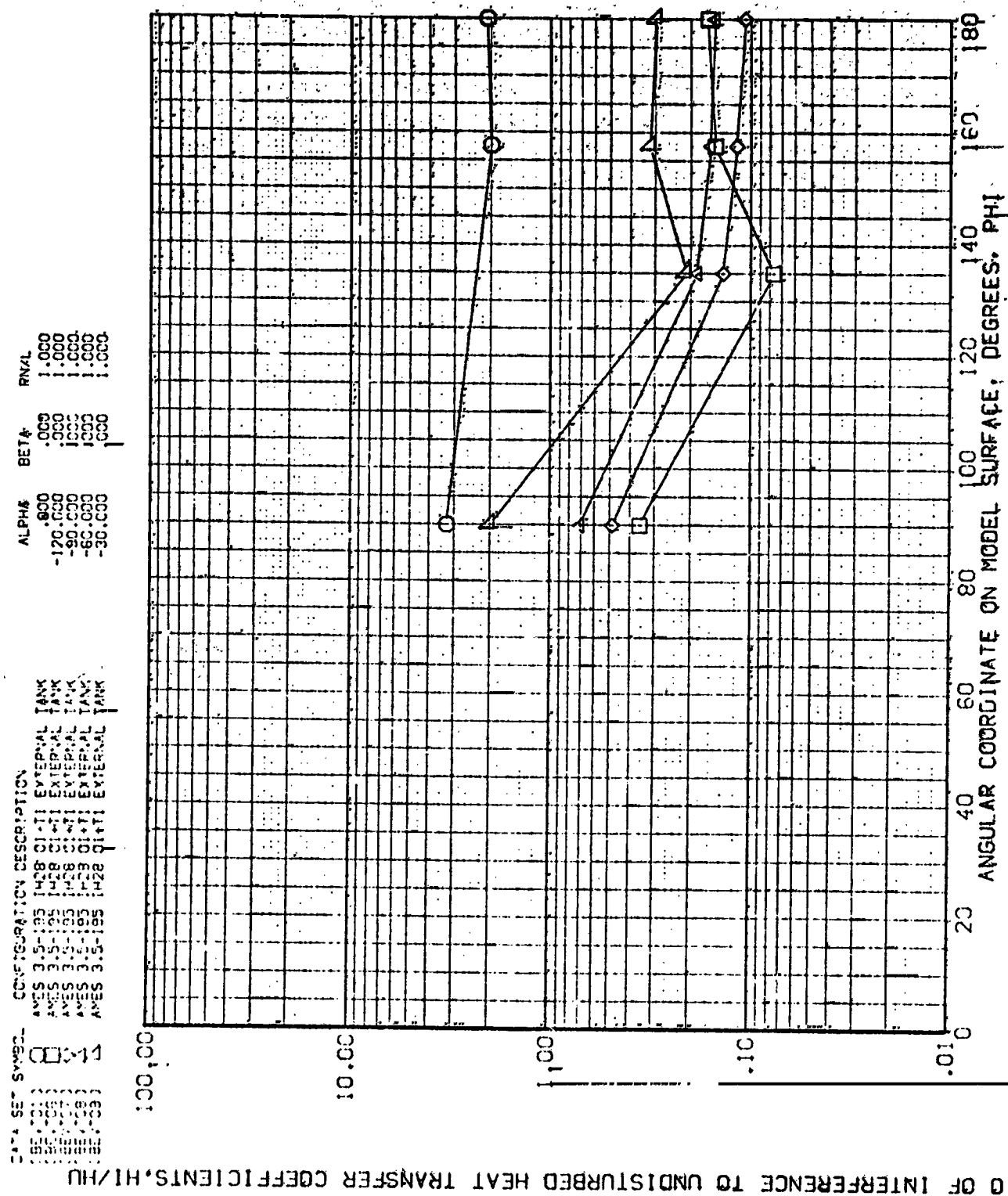


FIG. 6 TANK, RATIO OF INTERFERENCE TO UNDISTURBED

REACH = 5.300 HAW/HT = .900 X/L = .850



(REV. 19)

UNDERSIDE FUSELAGE

AMES 3.5-195 1H28 01

PARAMETRIC VALUES

ALPHA  
RN/L

.000  
1.000

BETA

.000

MACH  
5.220

BP  
.000

HA/WHT  
.850  
.900  
1.000

SV232L  
◇◇◇◇

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

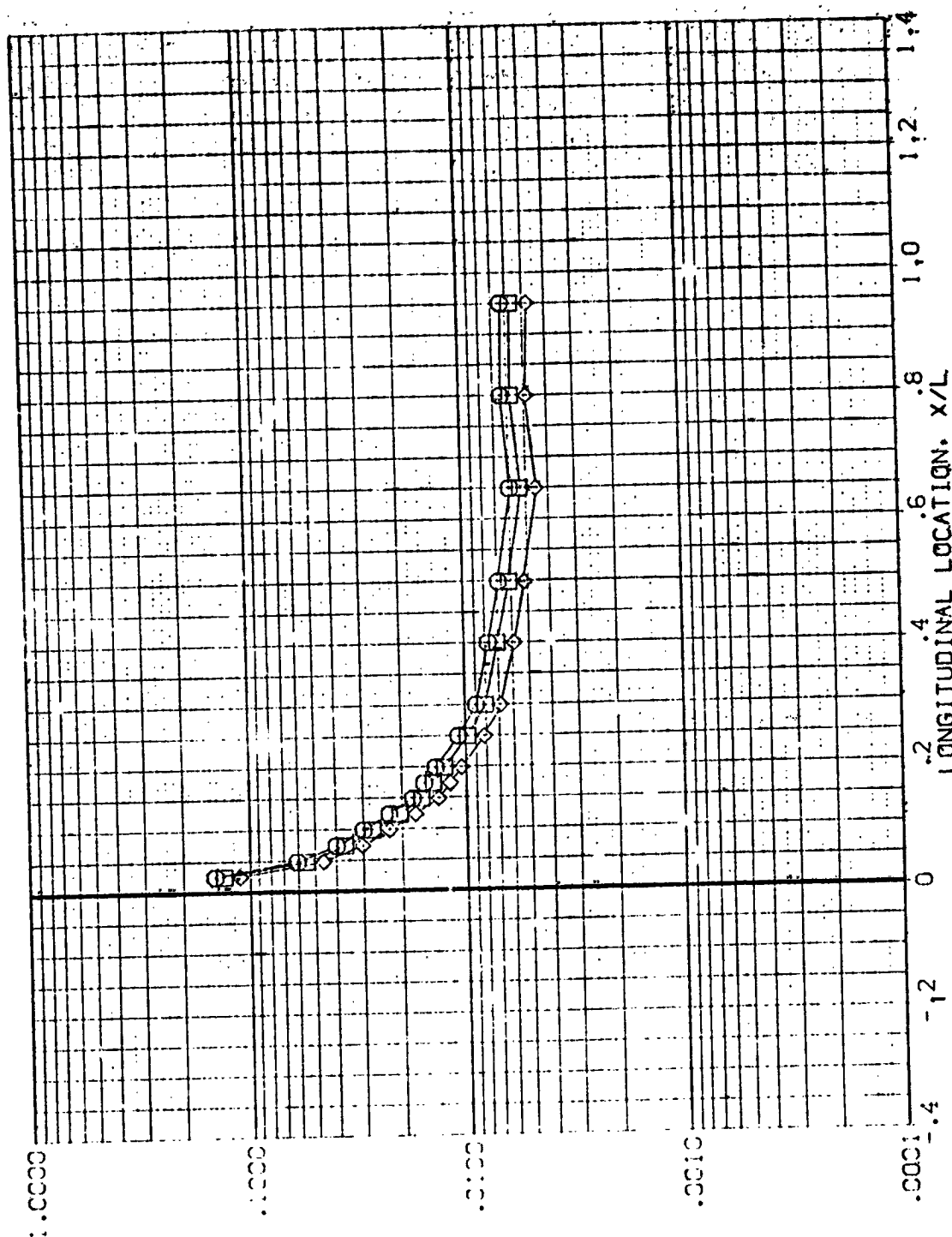


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AVES 3.5-195 IH28 01      (REVA19)      UNDERSIDE FUSELAGE

SYNTH      SP      MACH      W/L      BETA      .000  
 1.850      17.000      5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

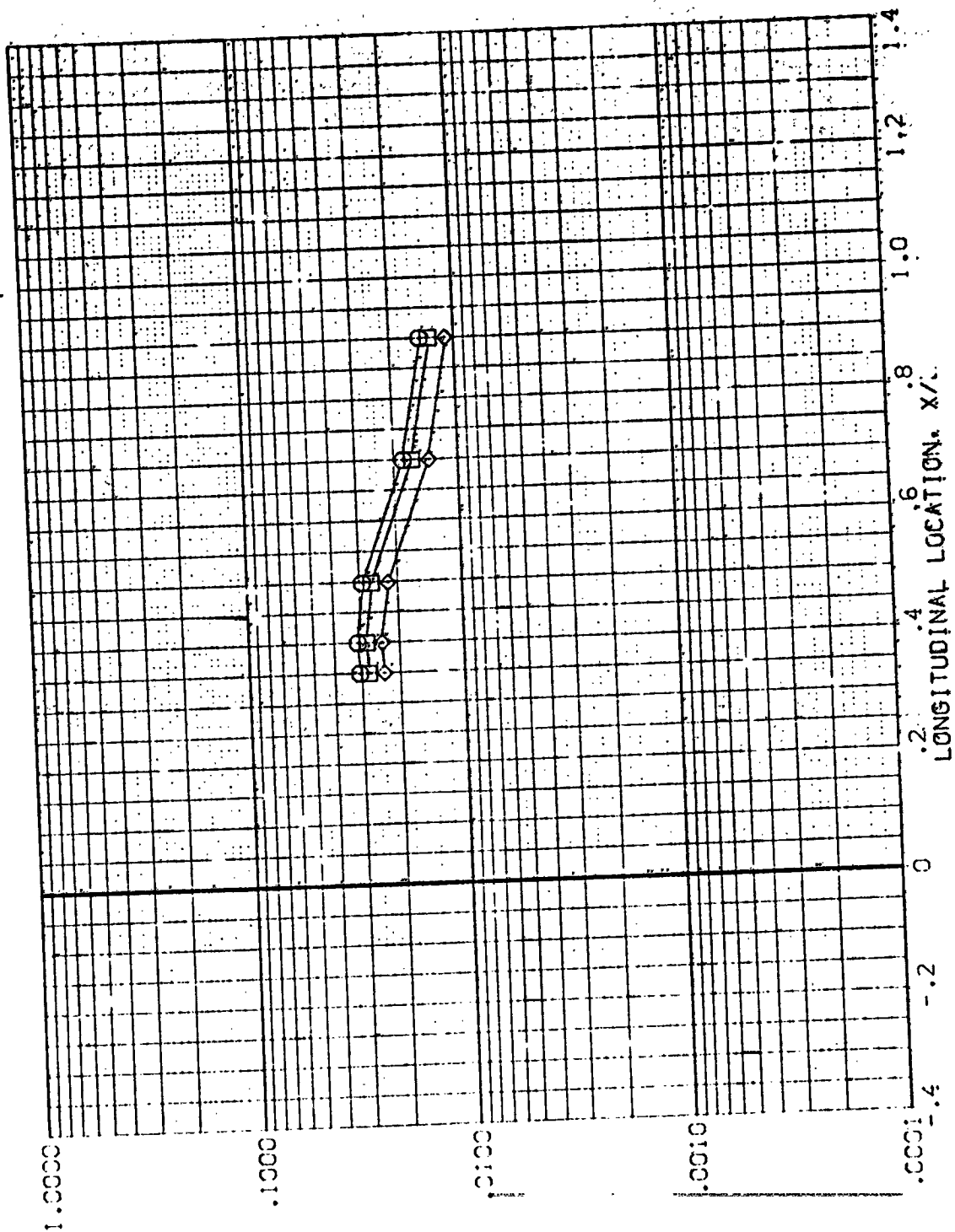


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

SYMBOL

MAV/HREF    BP    MACH

PARAMETRIC VALUES

ALPHA

BETA

RNVL

.000

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RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

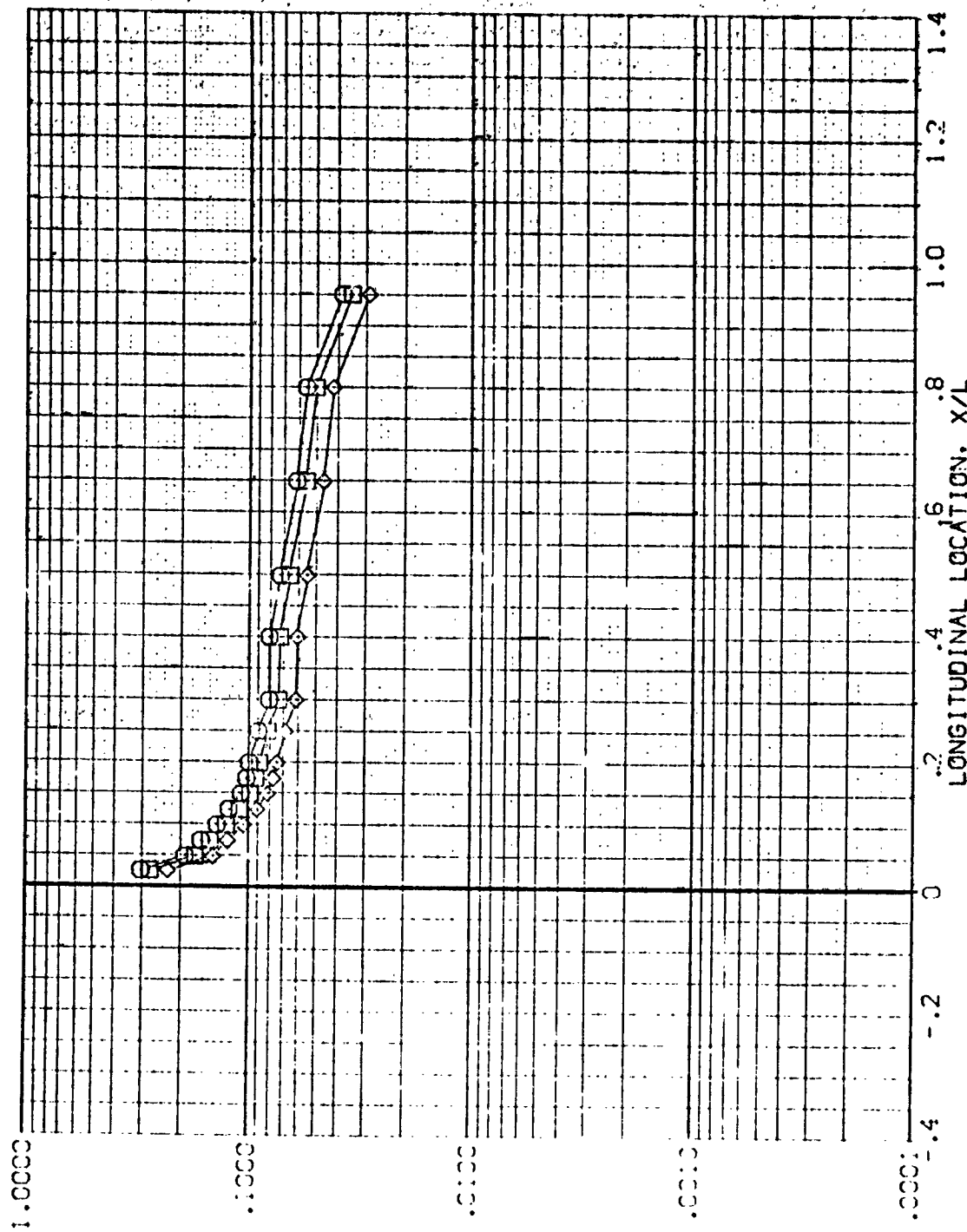


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AMES 3.5-195 IH28 C1      UNDERSIDE FUSELAGE      (REVA20)

SYMBOL	PARAMETER	VALUE	UNIT
◇	MA	0.850	
◇	BP	117.000	
◇	MACH	5.219	
◇	ALPHA	30.000	DEG
◇	PN/L	1.000	
◇	BETA	1.000	

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

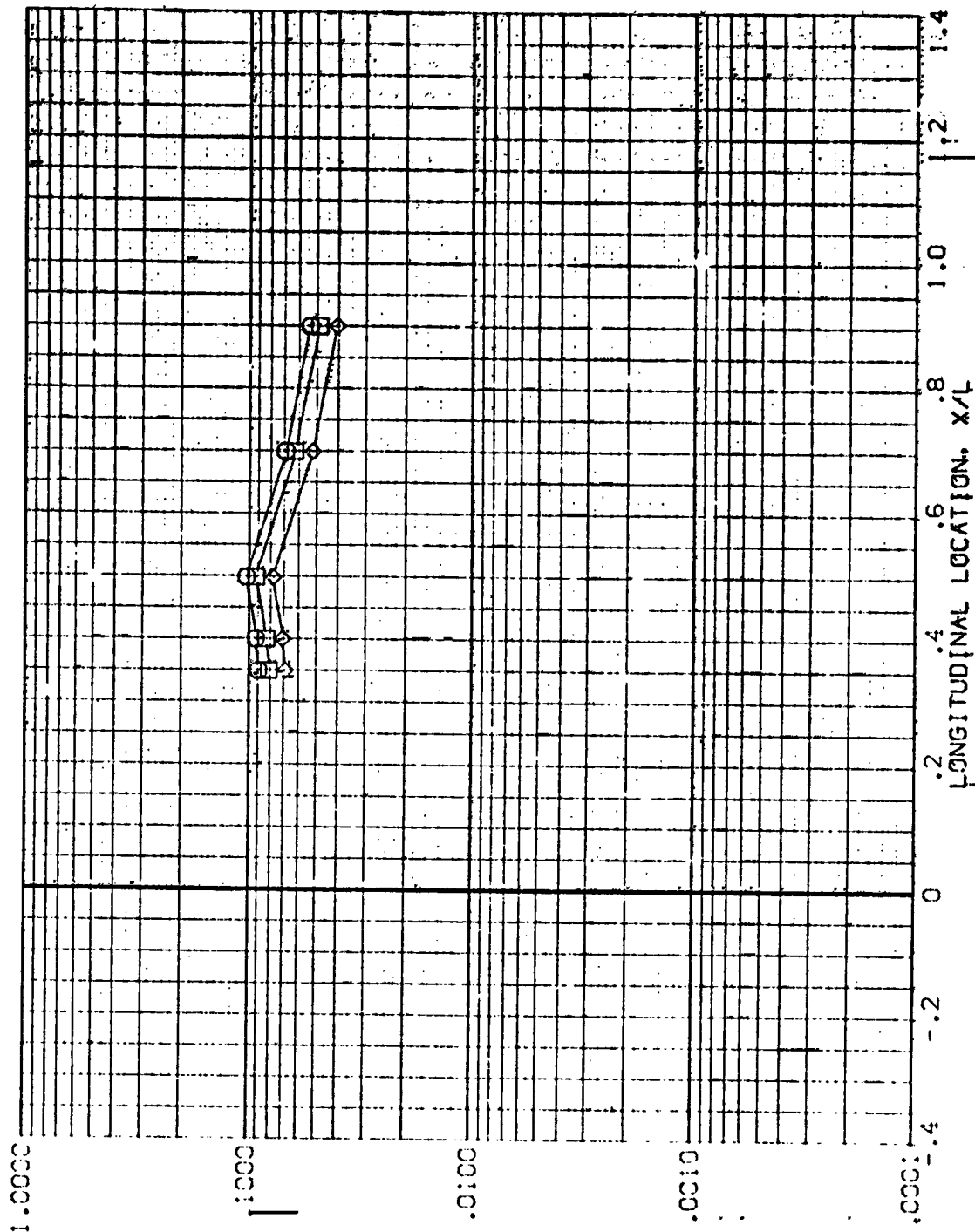


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AMES 3.5-195 IH28 01

UNDERSIDE FUSELAGE

(REVA21)

SYNTHETIC  
WIND TUNNEL  
BP .000  
WACH 5.220  
1.650  
1.300  
1.000

PARAMETRIC VALUES  
ALPHA 60.000  
BETA 1.000  
PN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

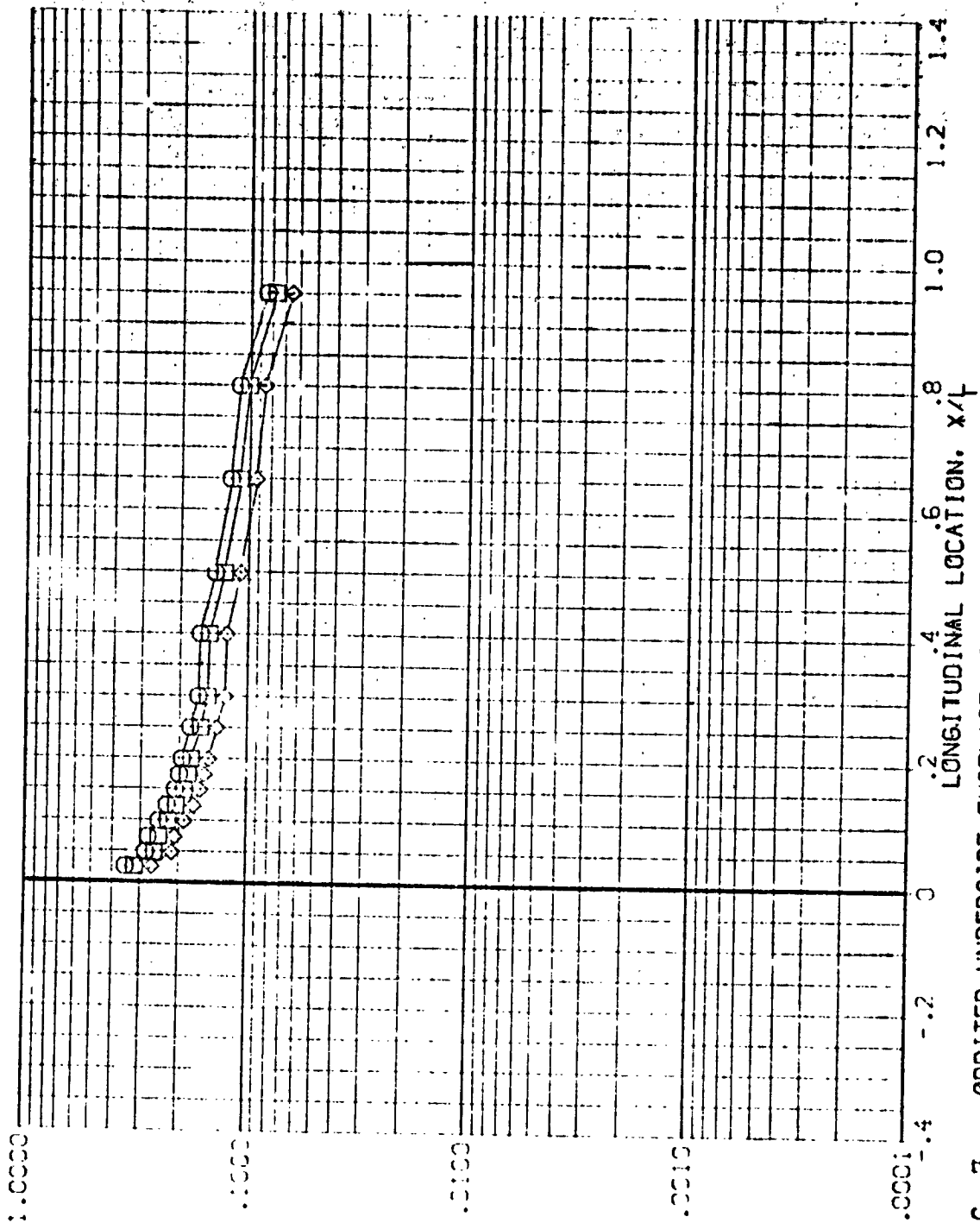


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

4-4-55 11:28 01

7/13  
6:44

5.220

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RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

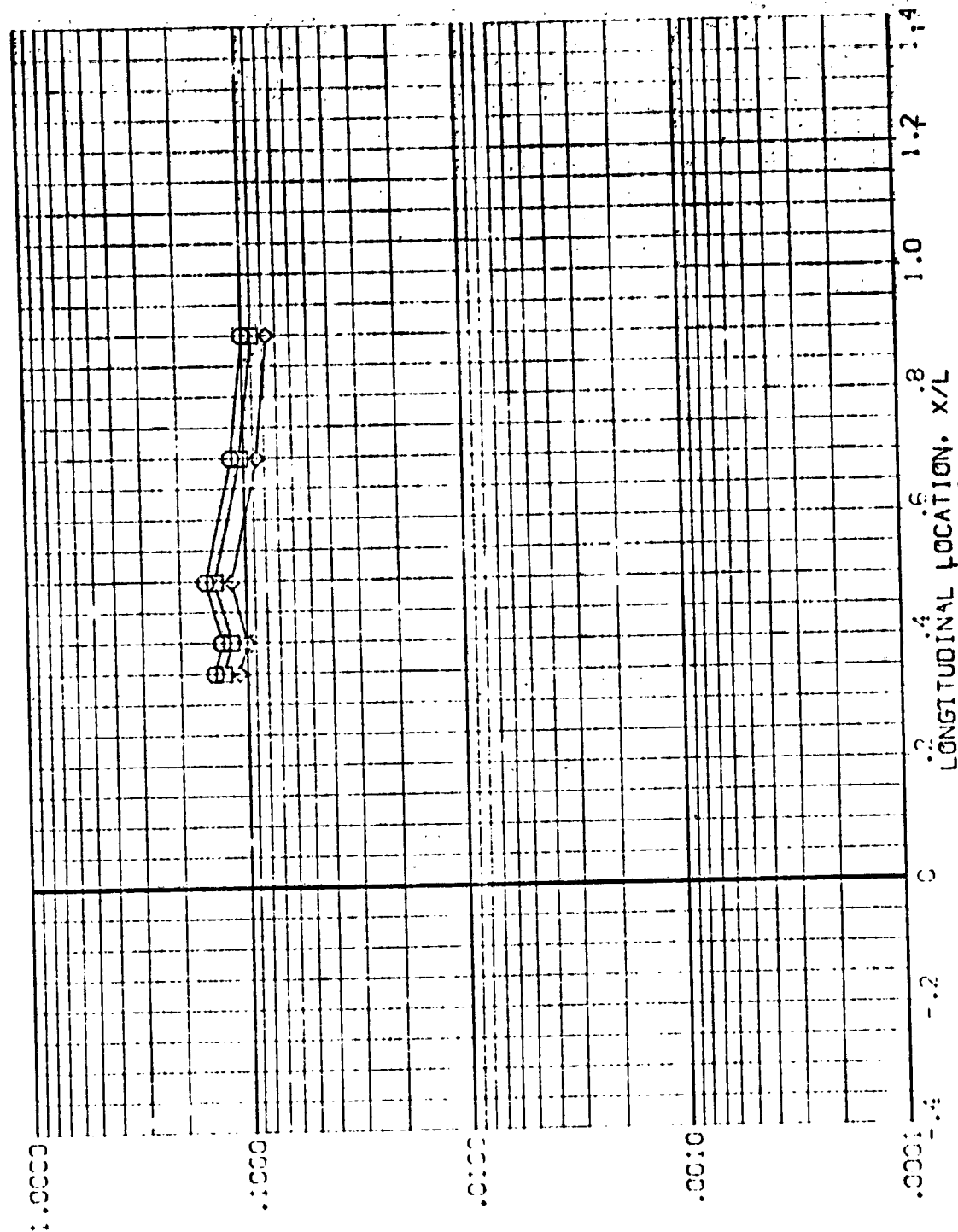


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE



(REVA22)

UNDERSIDE FUSELAGE

AVES 3.5-1.95 IH28 01

SYNTH  
HAB/MT  
BP  
MACH  
5.220

PARAMETRIC VALUES  
90.000 BETA  
1.000

ALPHA  
R1/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

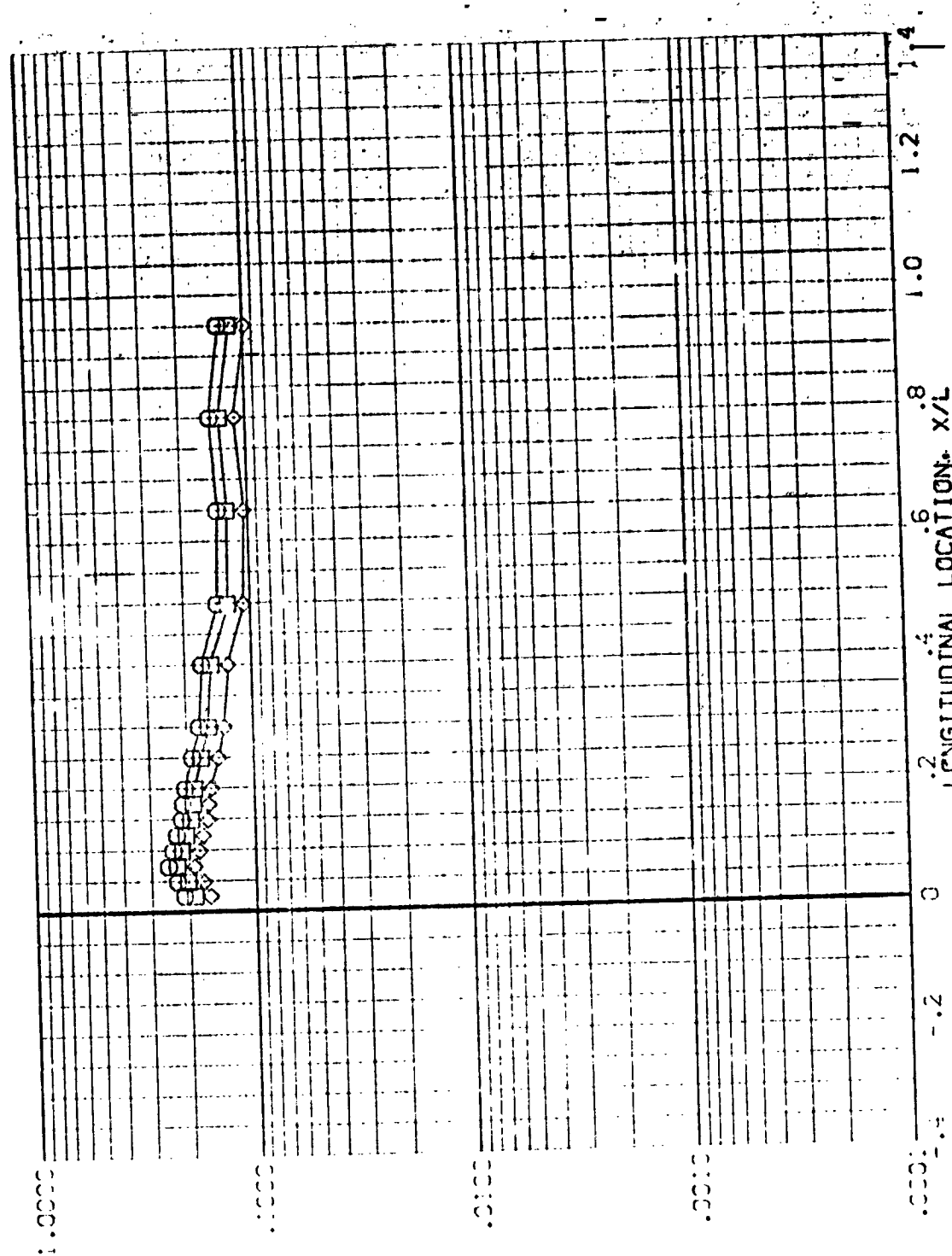


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

WES 3.5-195 1428 01 UNDERSIDE FUSELAGE (REVA22)

SYMBOL MACH SP MACH  
 010 .850 10.000 5.220  
 011 .900 10.000 5.220  
 012 1.000 10.000 5.220

PARAMETRIC VALUES  
 90.000 BETA  
 1.000  
 ALPHA  
 0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

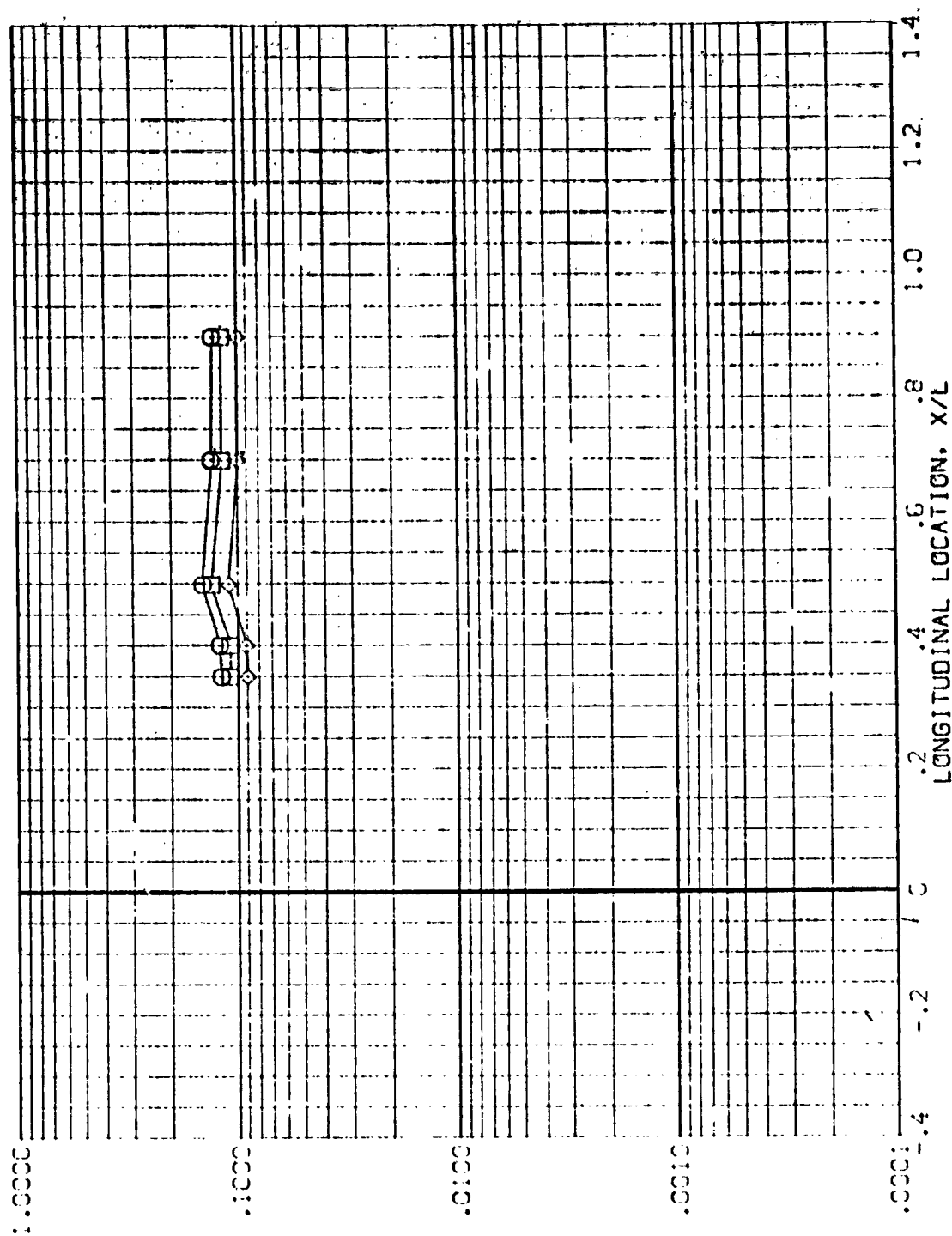


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

SVESL	WALL	BP	MACH	PARAMETRIC VALUES
1.000	1.000	1.000	5.220	ALPHA
1.000	1.000	1.000	1.000	BETA
1.000	1.000	1.000	1.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

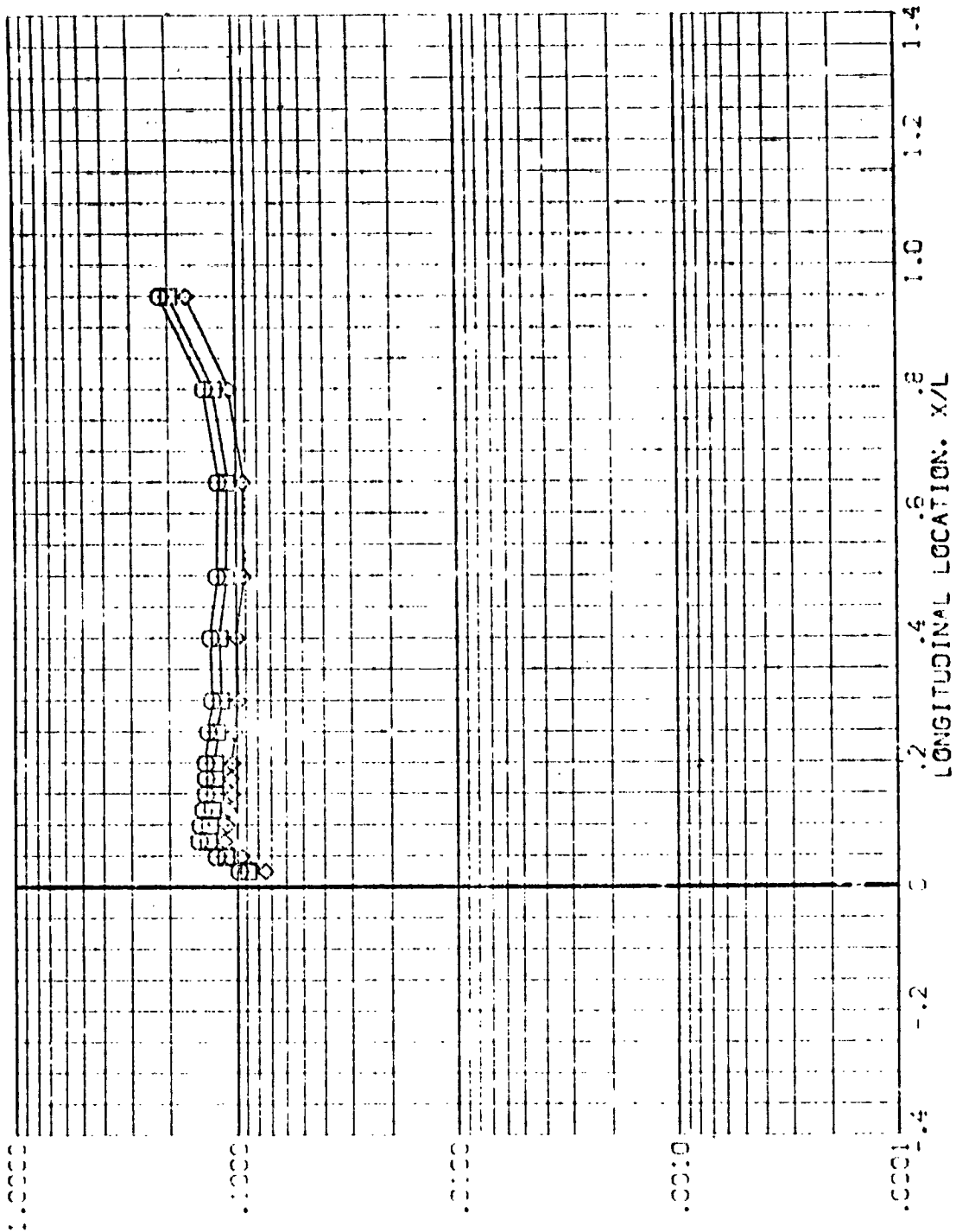


FIG. 7 ORBITER UNDERSIDE FUSELAGE. ORBITER ALONE

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

# AXES 3,5-195 :H28 C:      UNDERSIDE FUSELAGE      (REVA23)

SVCEL    H<sub>REF</sub>/H<sub>T</sub>    BP    MACH  
 .850    1:17.000    5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA    BETA  
 R<sub>W</sub>/L    1.000  
 .000

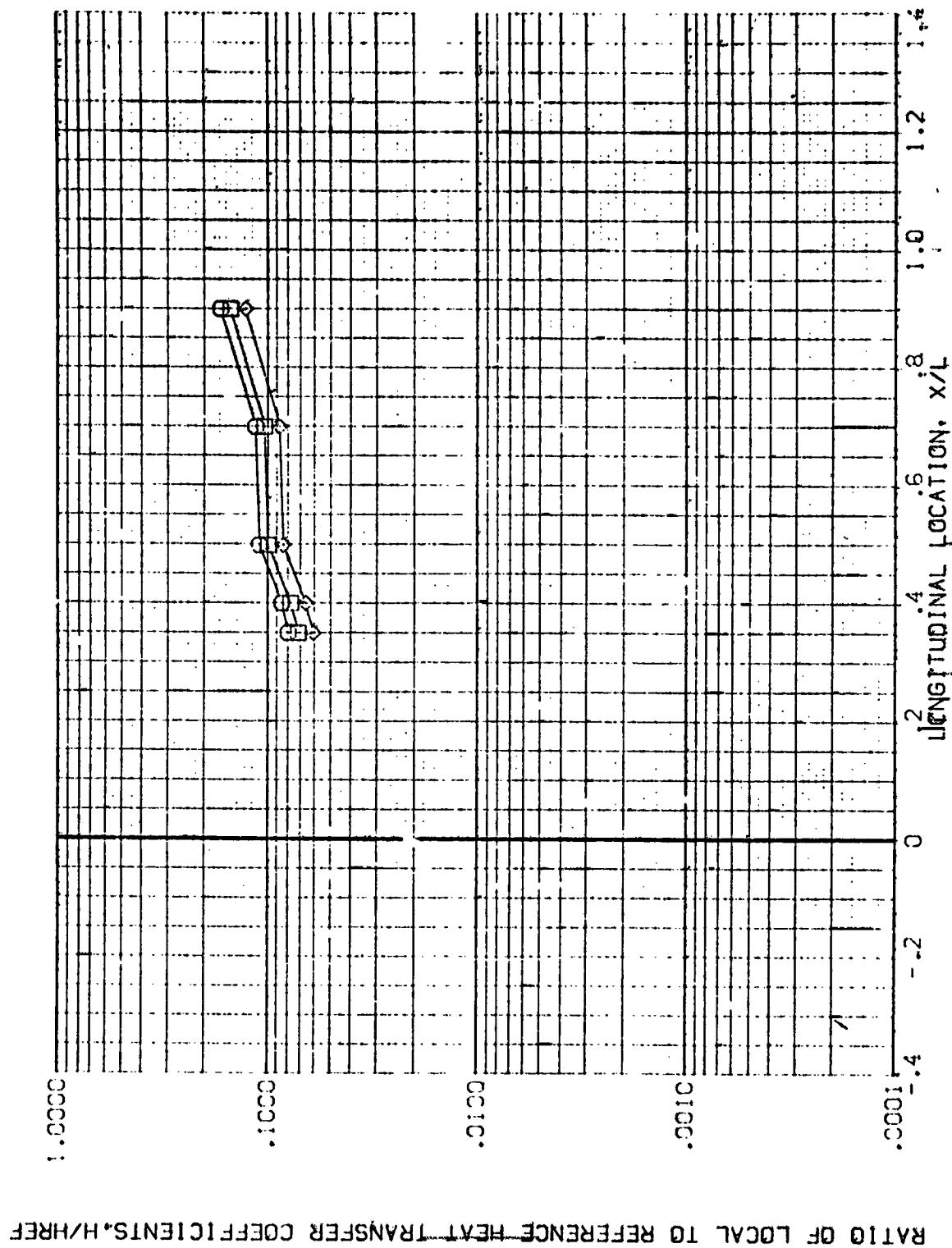


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AMES 3.5-195 IH28 01

UNDERSIDE FUSELAGE

(REVA24)

SYMBOL  
 HAW/H  
 BP  
 MACH  
 0.850  
 0.900  
 1.000

0.000  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RH/L  
 -120.000  
 1.000

0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

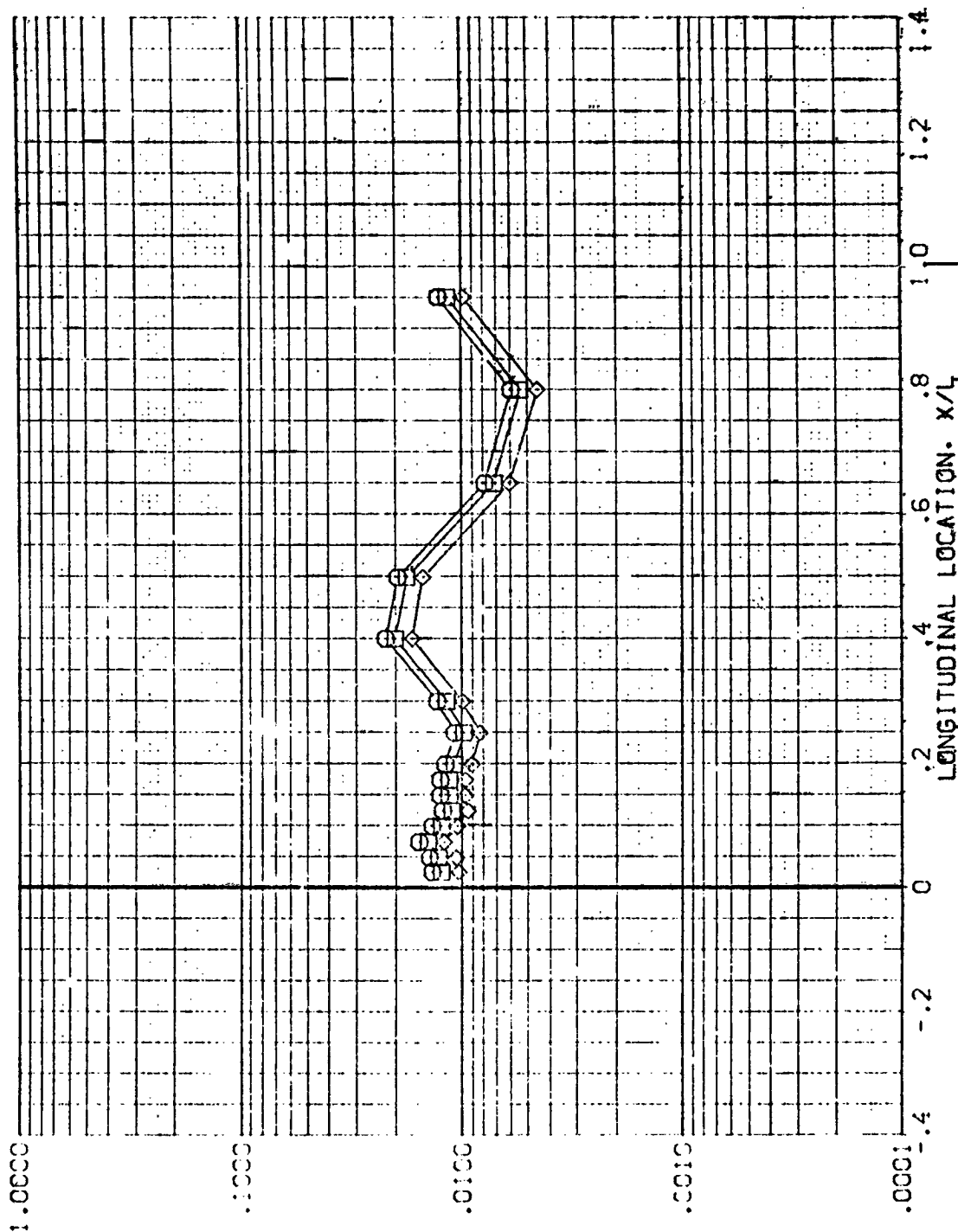


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AVES 3.5-195 IH28 01:      UNDERSIDE FUSELAGE      (REVA24)

PARAMETRIC VALUES  
 ALPHA      BETA  
 PN/L      1.000

SYNCH      BP      MACH  
 .850      1.17.000      5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

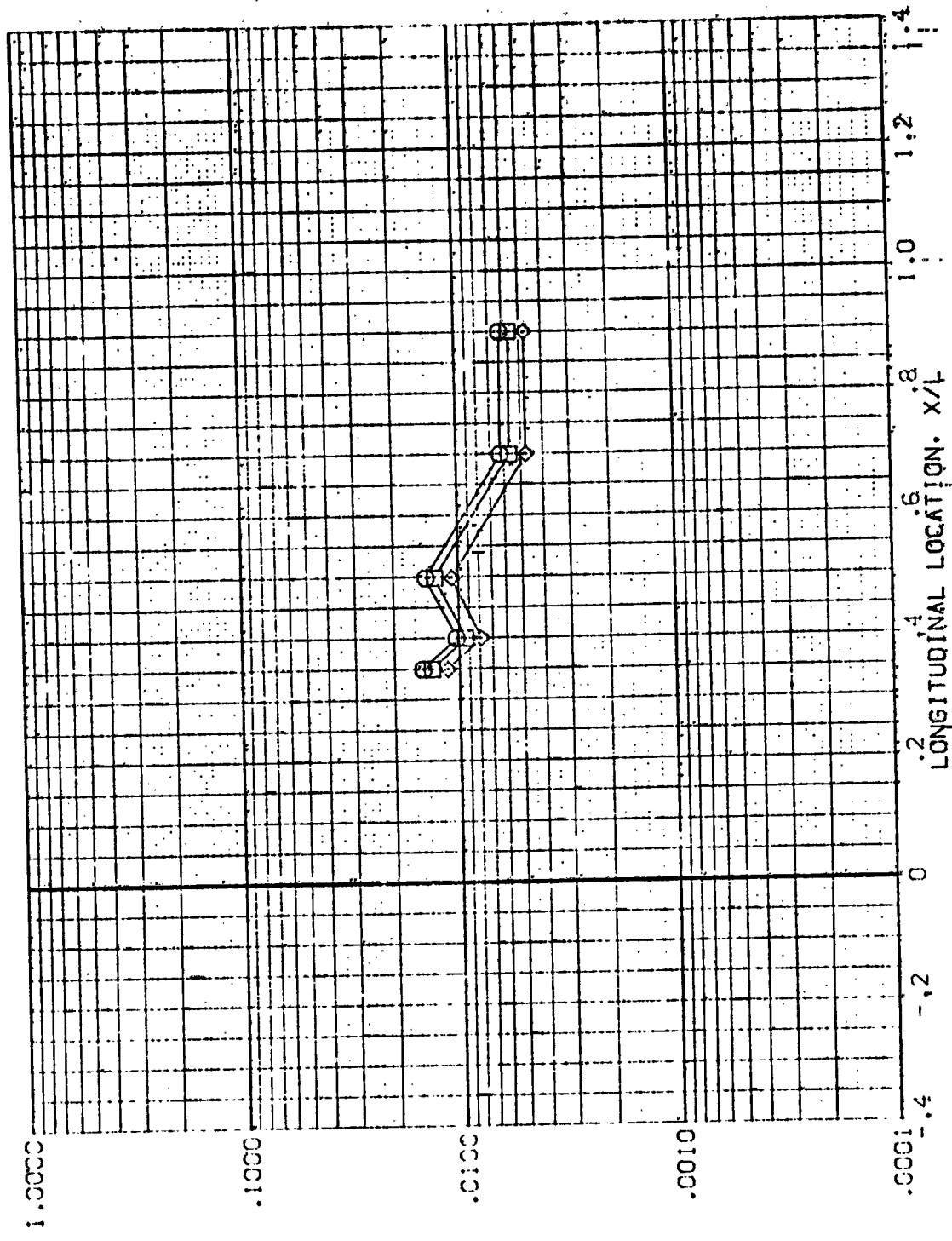


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

PARAMETRIC VALUES  
 ALPHA#      BETA  
 R1/L      1.000      .000

SYMBOL      HAW/HT      EP      MACH      5.219  
 .850      .000  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

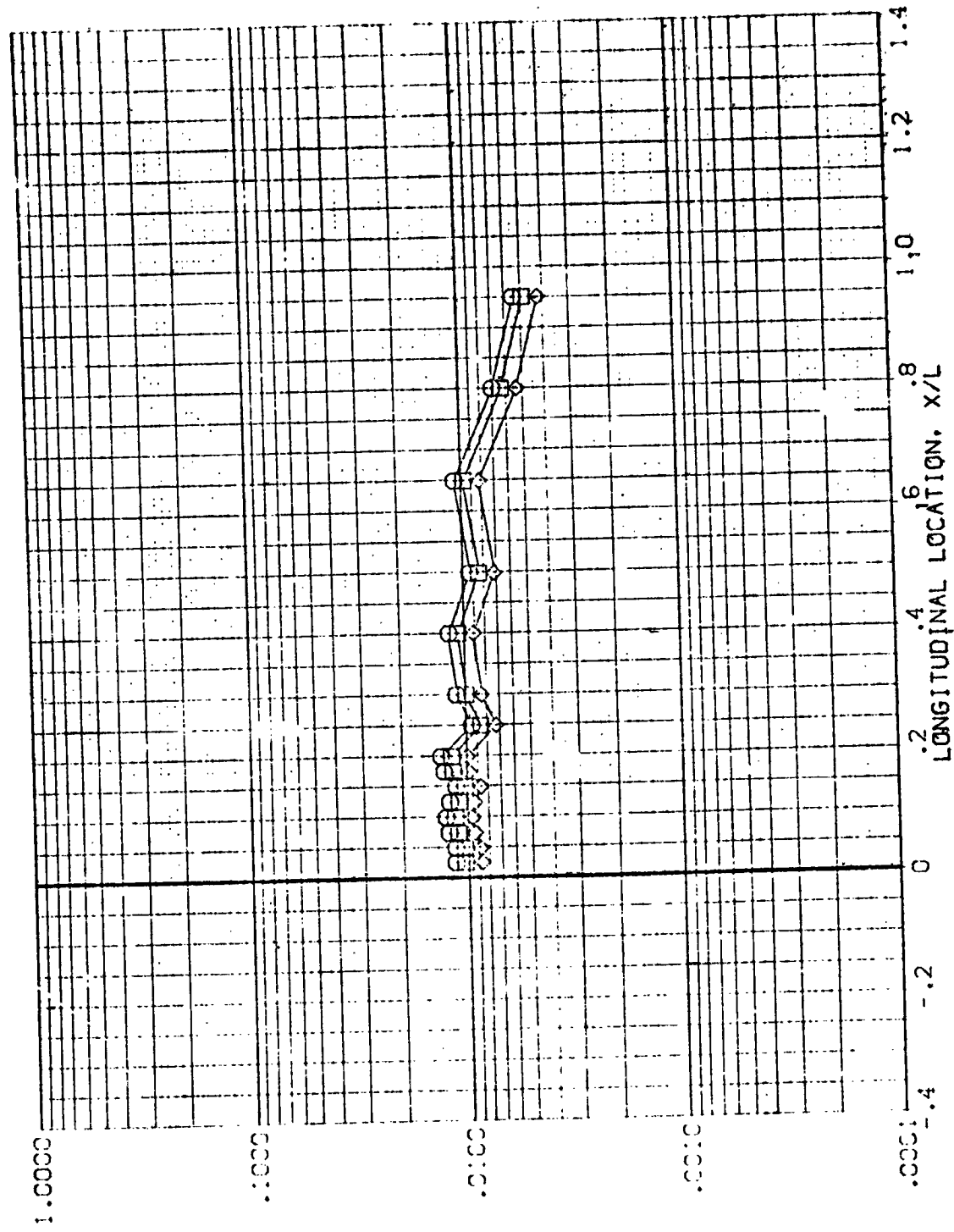


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

UNCEPSIDE FUSELAGE

YES 3.5-:95 1H28 01

5-2-6  
HCH

PARAMETRIC VALUES	
--EJ.000	BETA
1.000	.000

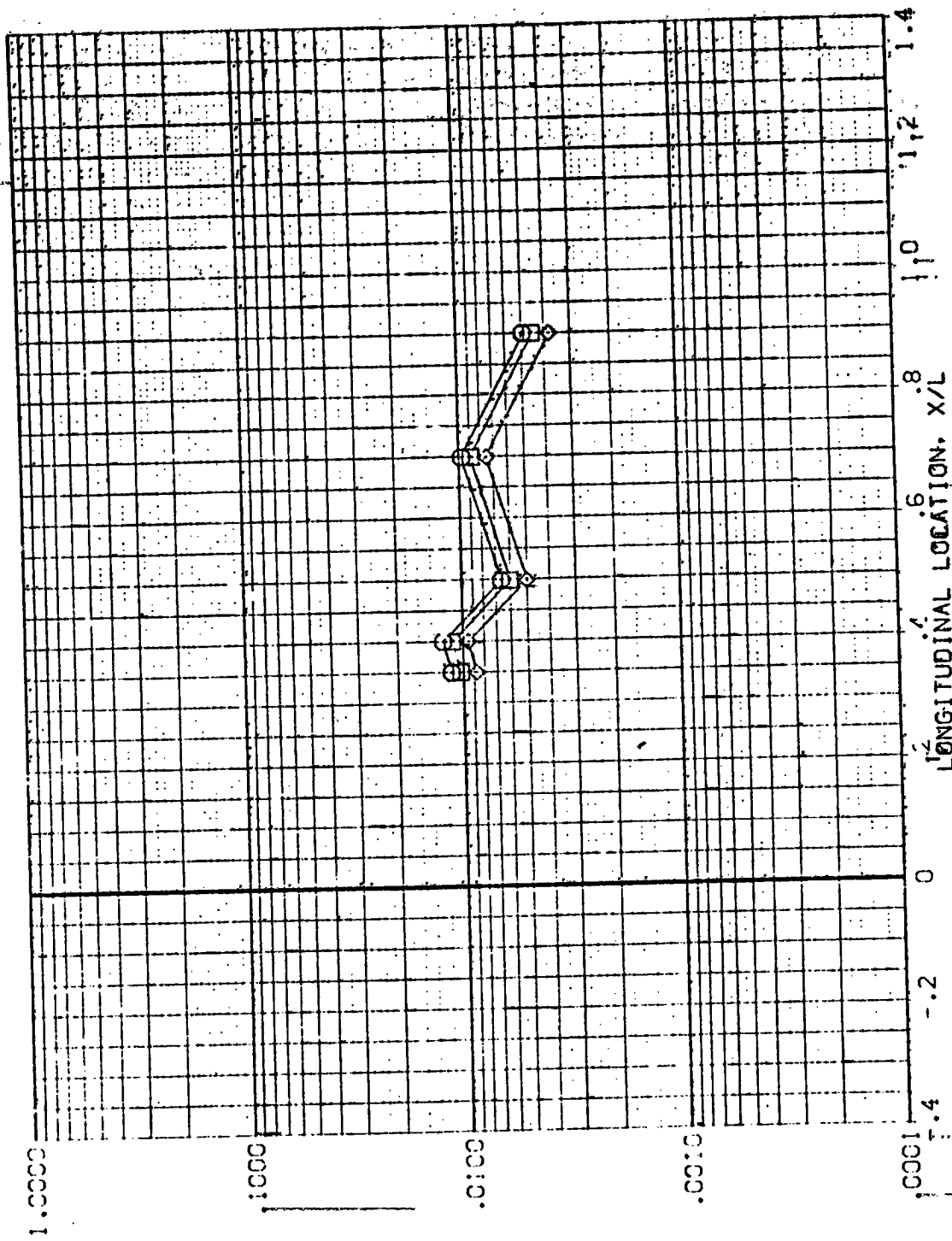
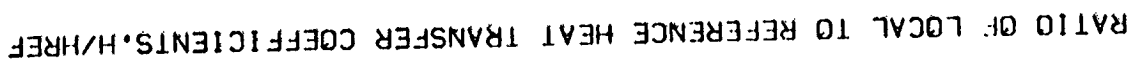


FIG. 7  
ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE



AVES 3.5-195 1H28 01 UNDERSIDE FUSELAGE (REVA26)

SYNSEC. HAW/RT SP MACH  
 .000 5.220  
 .920  
 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

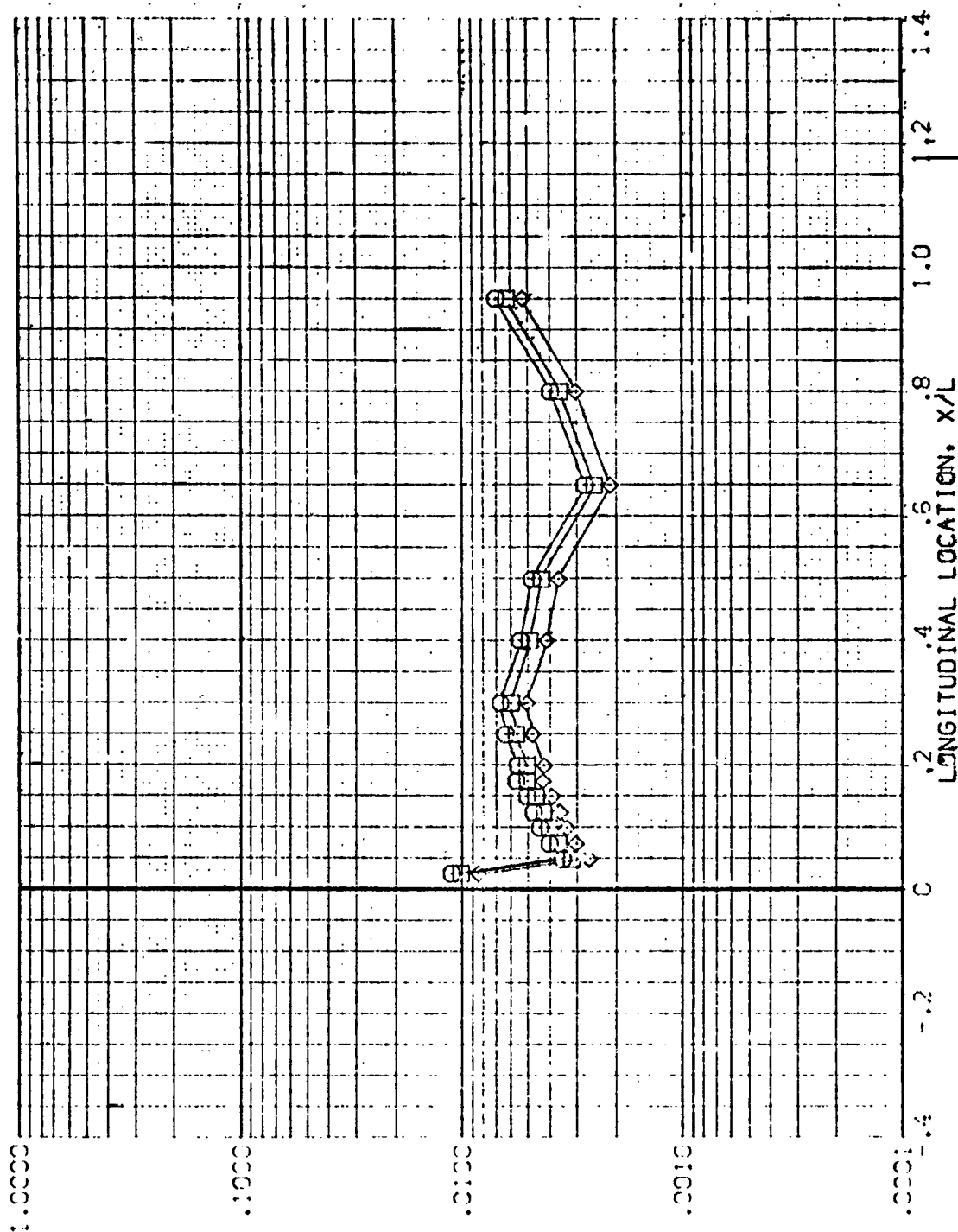


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AMES 3.5-195 1H28 01

UNDERSIDE FUSELAGE

(REVA26)

S-BCL  
 HAW/HT .850  
 BP 117.000  
 MACH 5.220  
 1.000

PARAMETRIC VALUES  
 ALPHA  
 R/L  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

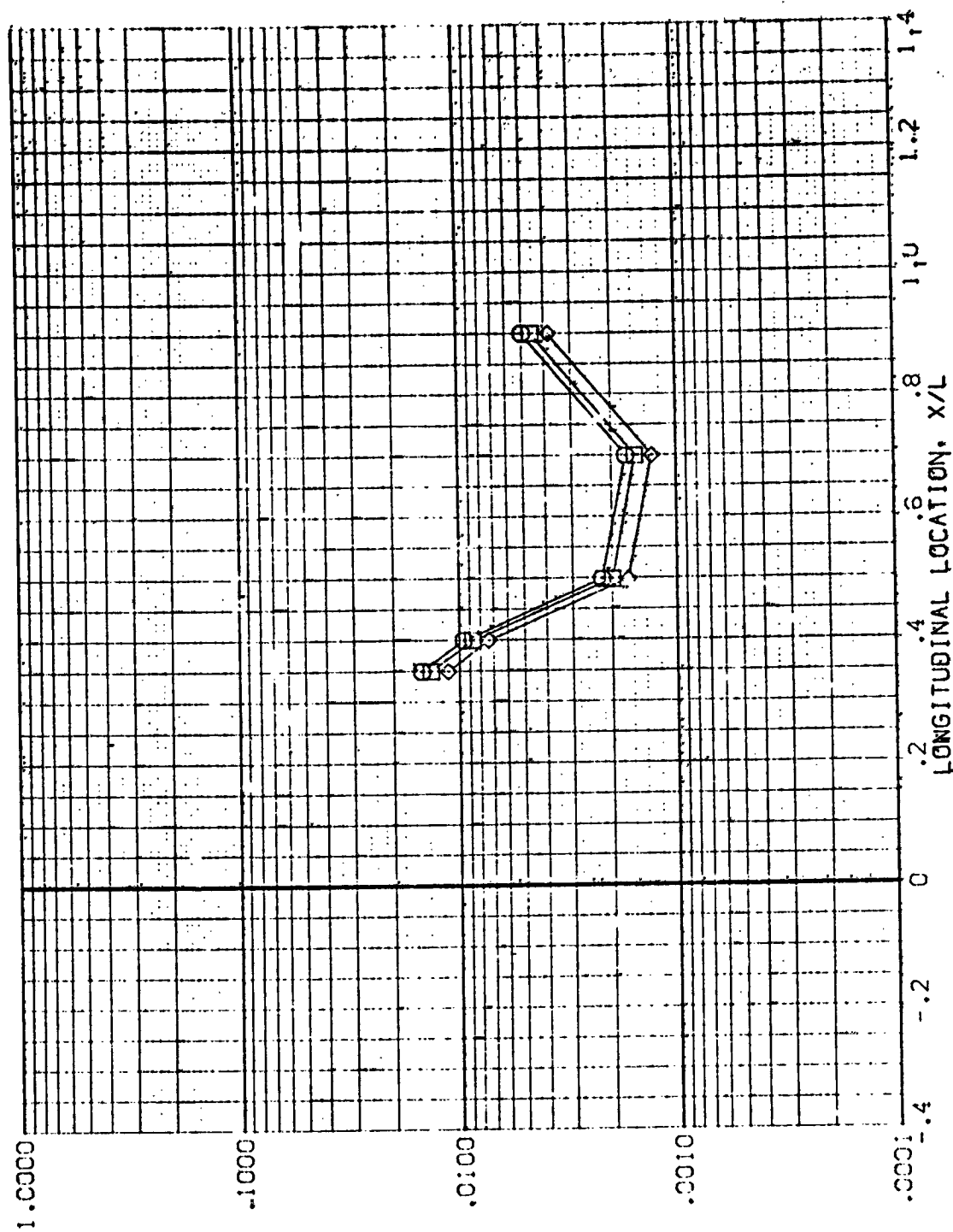


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AMES 3.5-195 1H28 01

UNDERSIDE FUSELAGE

(REVA27)

PARAMETRIC VALUES  
ALPHA 1.000  
BETA 1.000  
RV/L 1.000

5-200L  
MACH 5.220  
BP 1.000  
RV/L 1.000

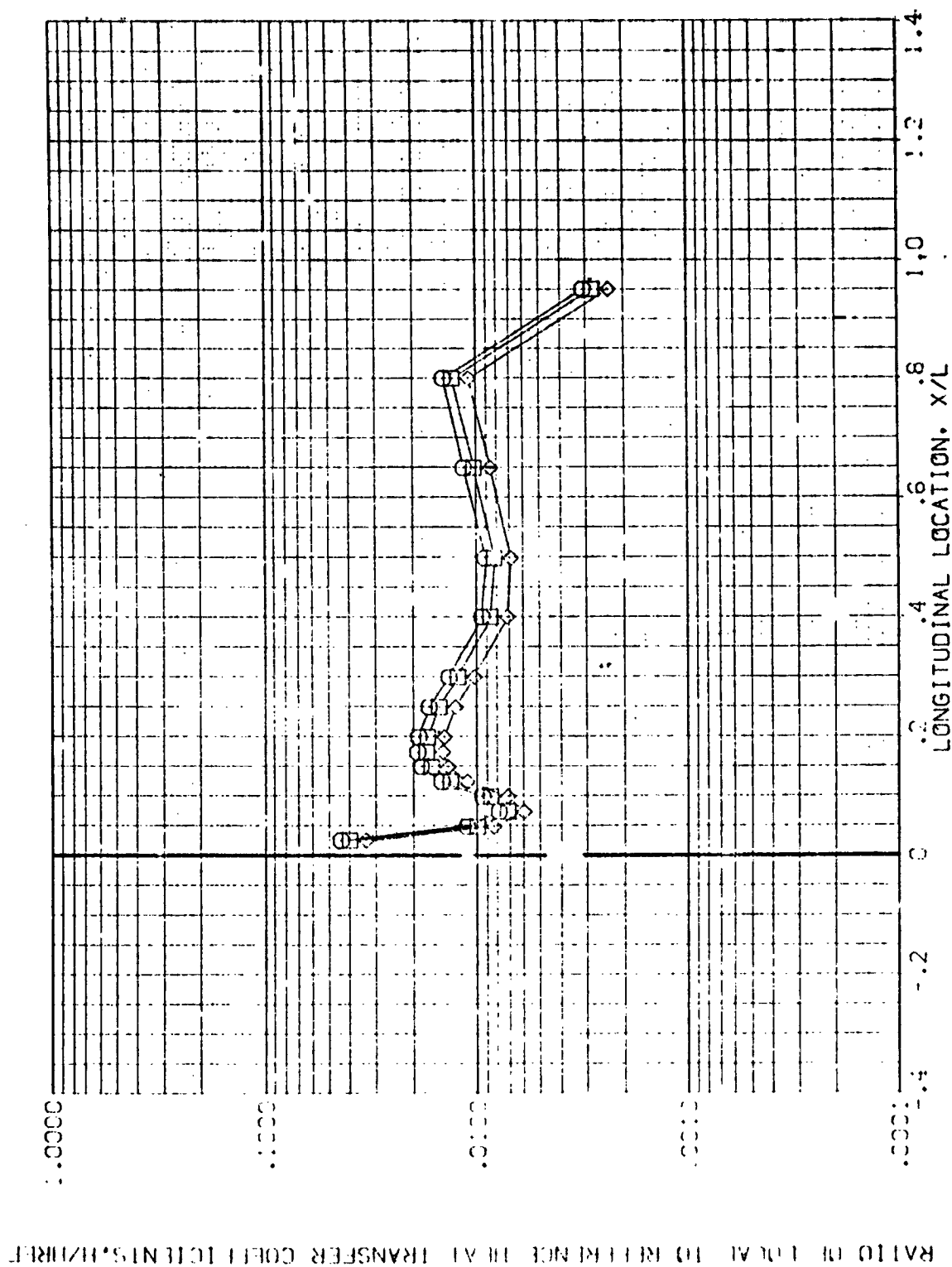


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

AVES 3.5-195 1428 01

UNDERSIDE FUSELAGE

(REVA27)

PARAMETRIC VALUES  
 ALPHA  $R^4/L$   $-30.000$   $BETA$   $1.000$   
 MACH  $5.220$   
 BP  $117.000$   
 HREF  $1.000$   
 HREF  $1.000$

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

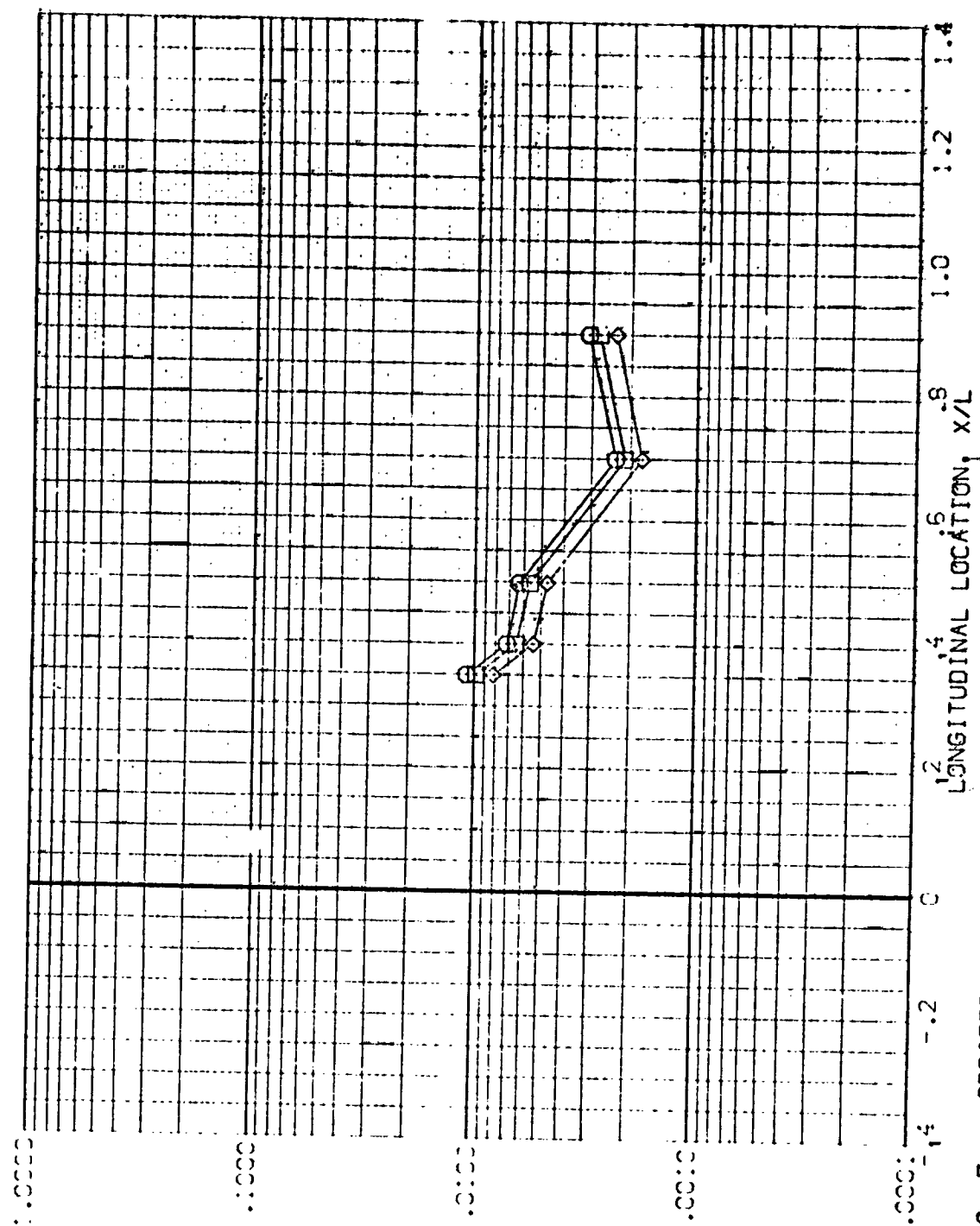


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

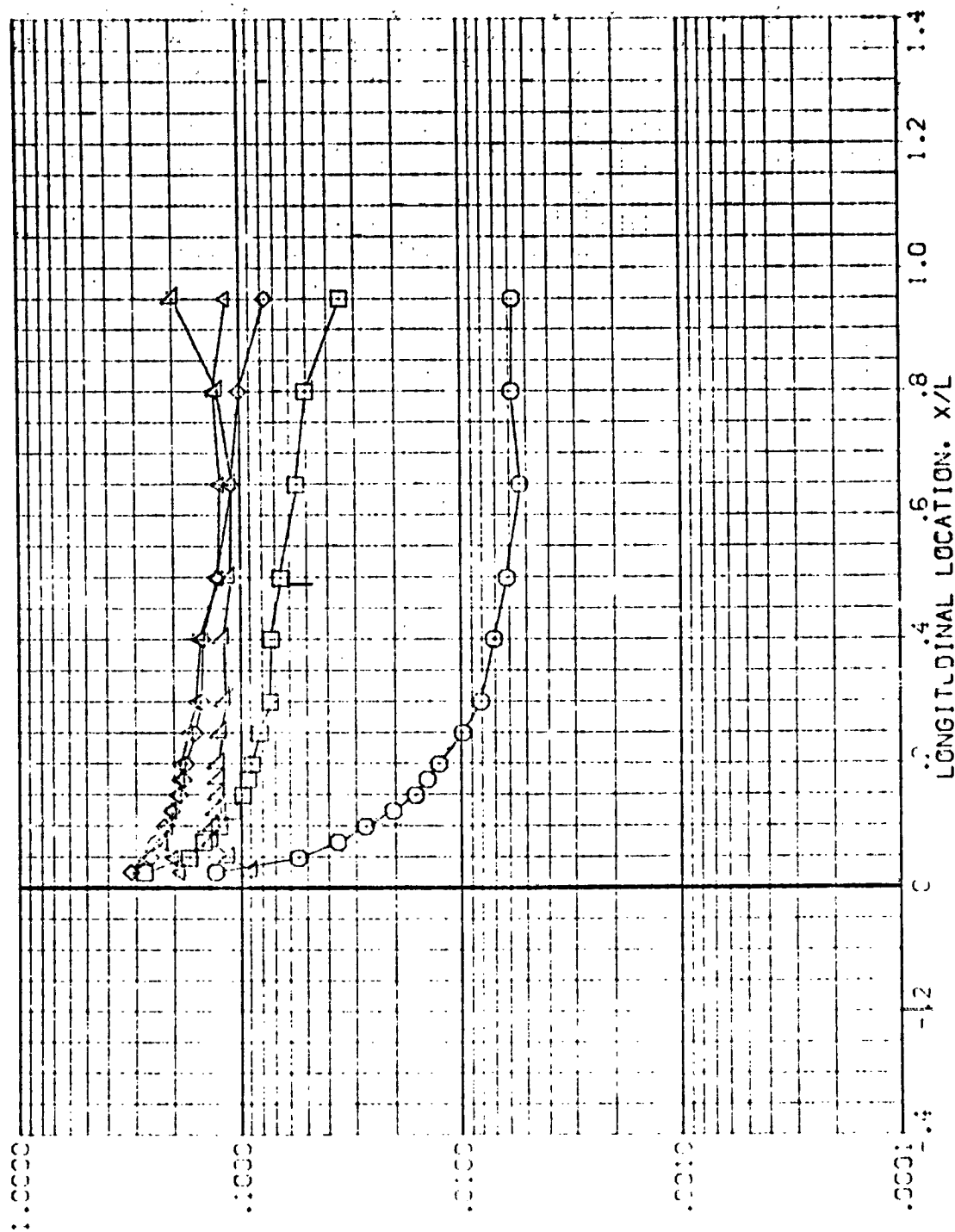
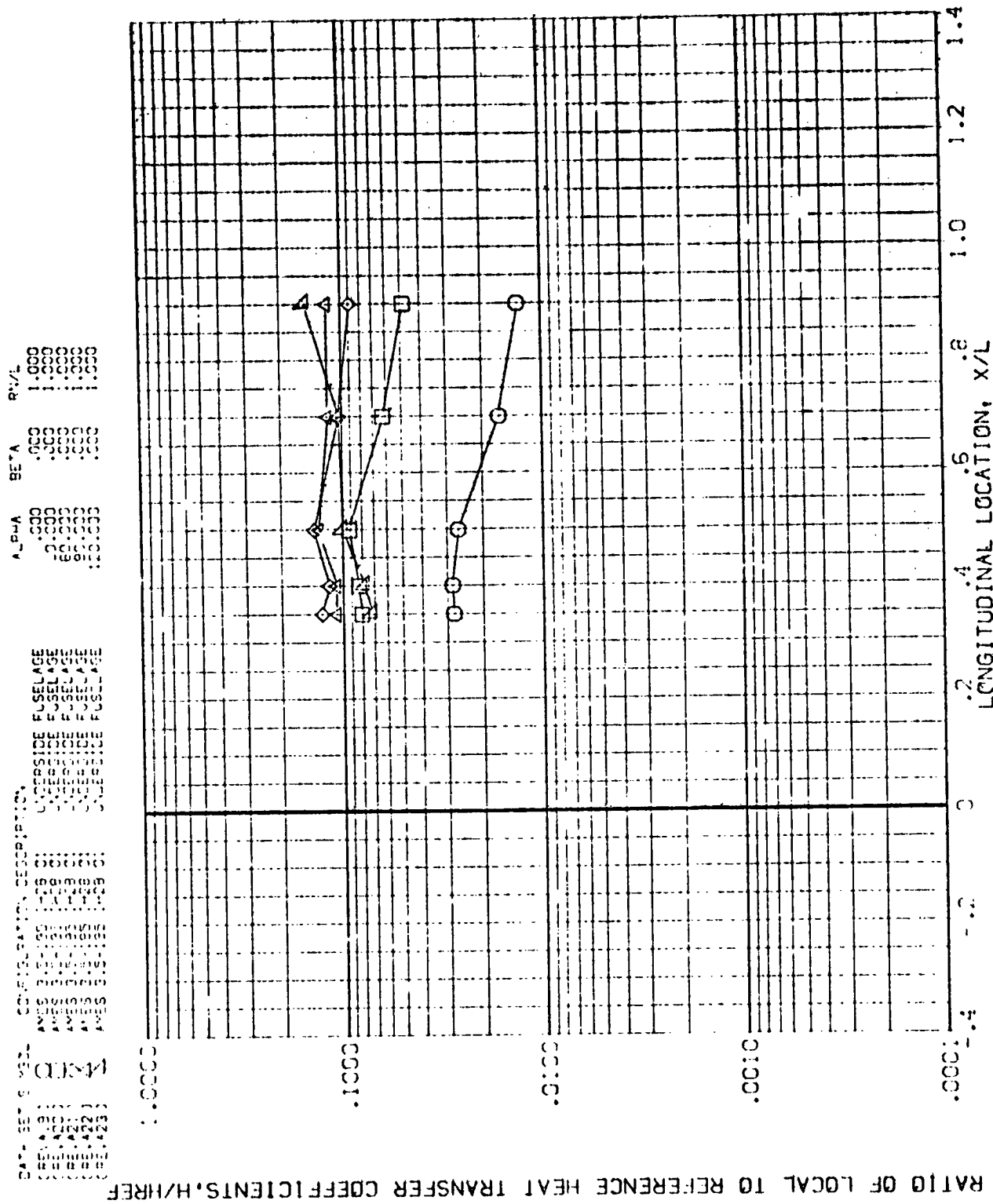
[illegible]

FIG. 7 GREATER UNDERSIDE FUSELAGE, ORBITER ALONE

[illegible]





ALPHA BETA P/L

DESCRIPTION

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

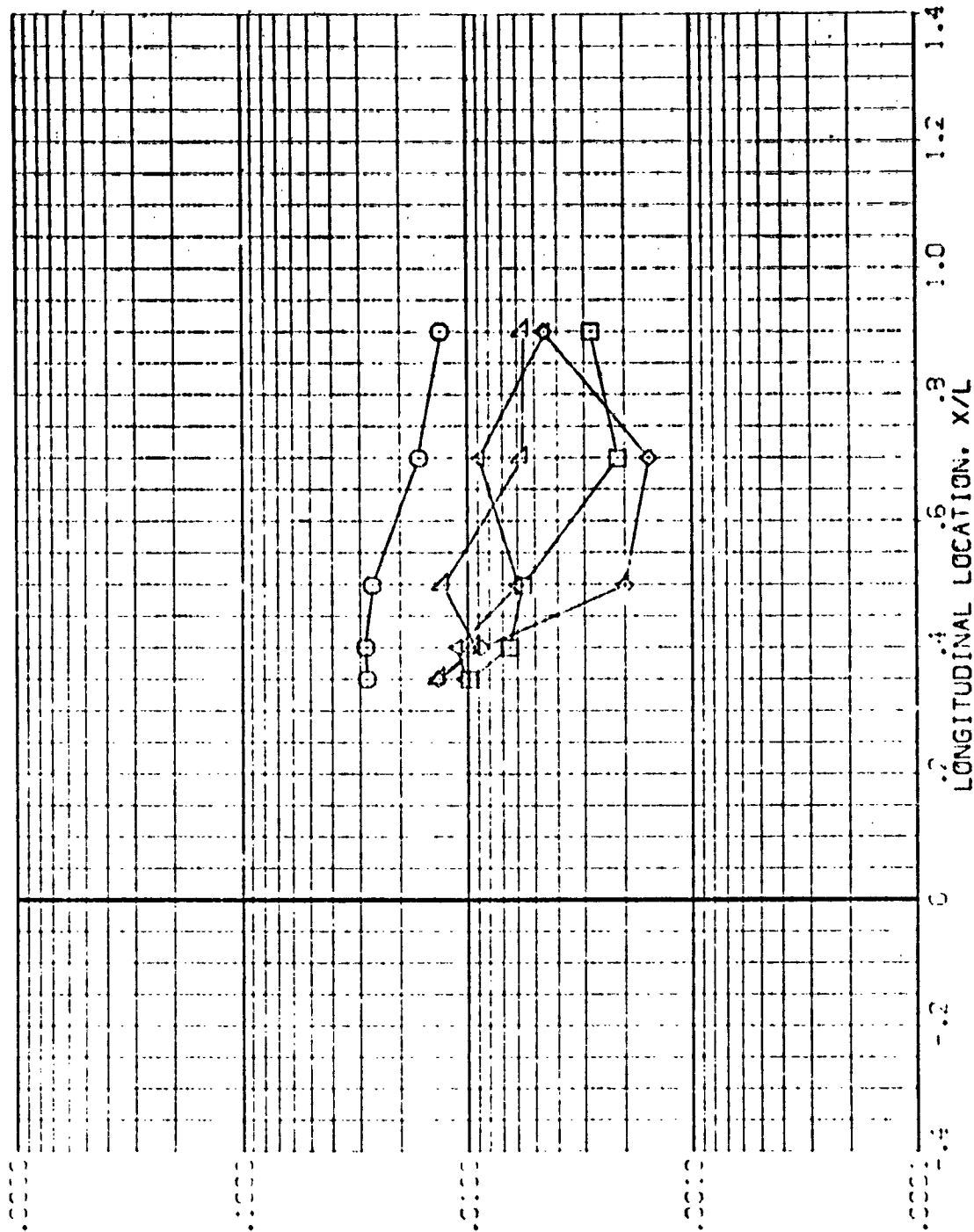


FIG. 7 ORBITER UNDERSIDE FUSELAGE, ORBITER ALONE

WACH = 5.200 -14.000 = 0.200 EF = 117.000



SYMBOL WEIGHT BP MACH  
 ◇ .850  
 □ .900  
 ○ .900  
 △ .900

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 R/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

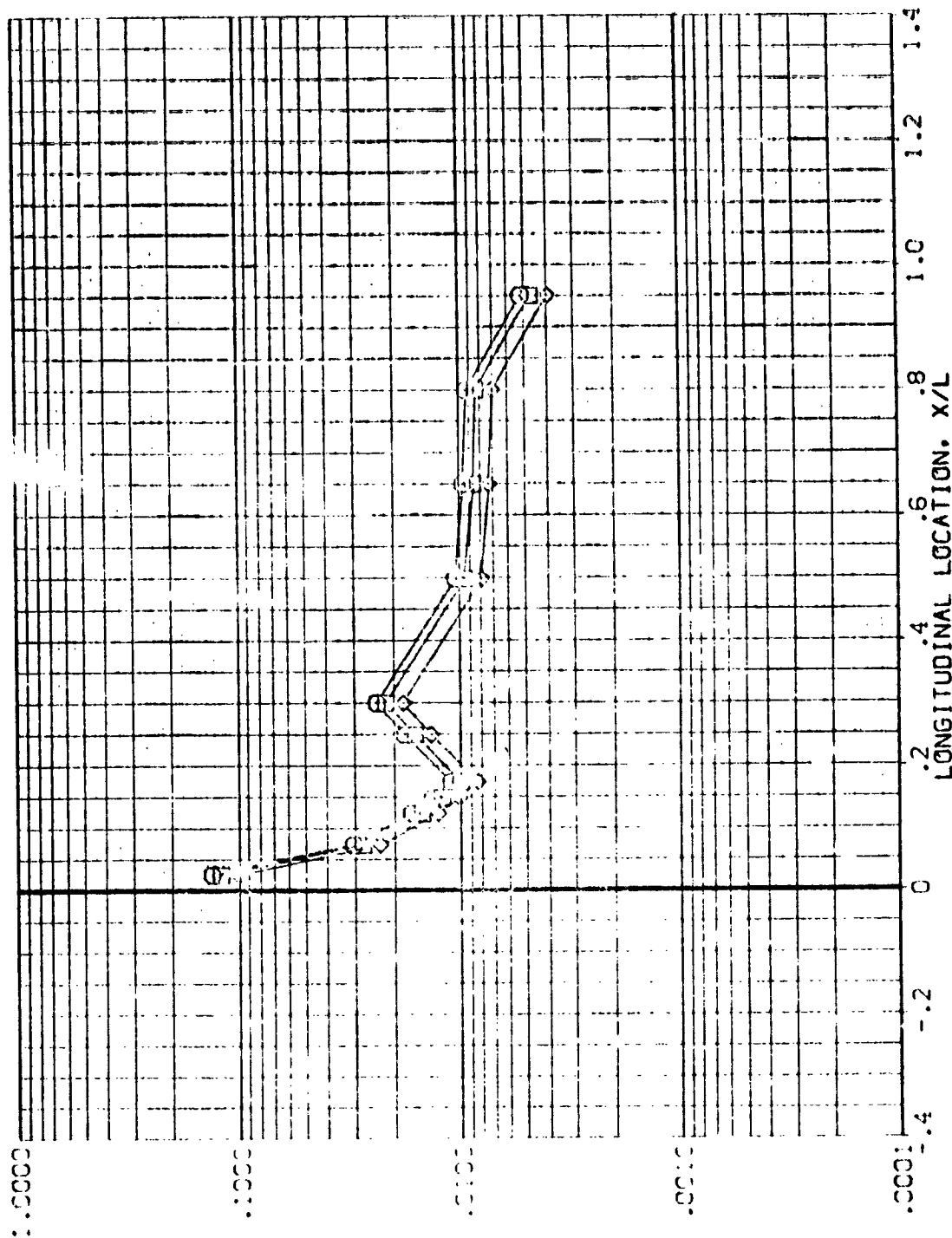


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AMES 3,5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(REVAQ1)

SYMBOL	HAW/HT	BP	MACH	PARAMETRIC VALUES	
				1-PHA R/L	BETA
◇	.850	117.000	5.228	1.000	.000
□	.900			1.000	
◇	1.000				

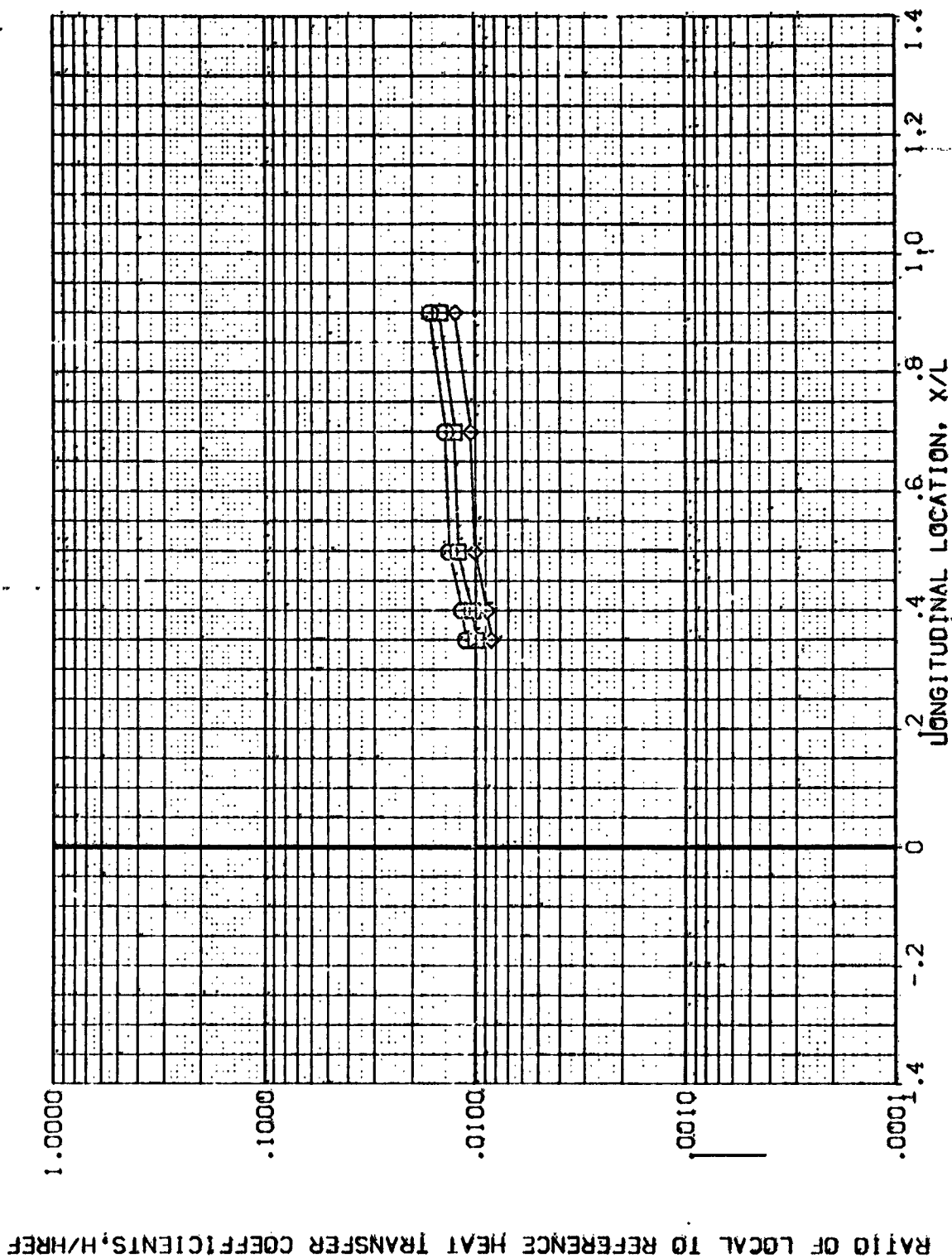


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(REVA02)

SVNCEL MACH  
 .850  
 .900  
 1.000

BP .000 MACH  
 5.219

PARAMETRIC VALUES  
 30.000 BETA  
 1.000 R/V/L

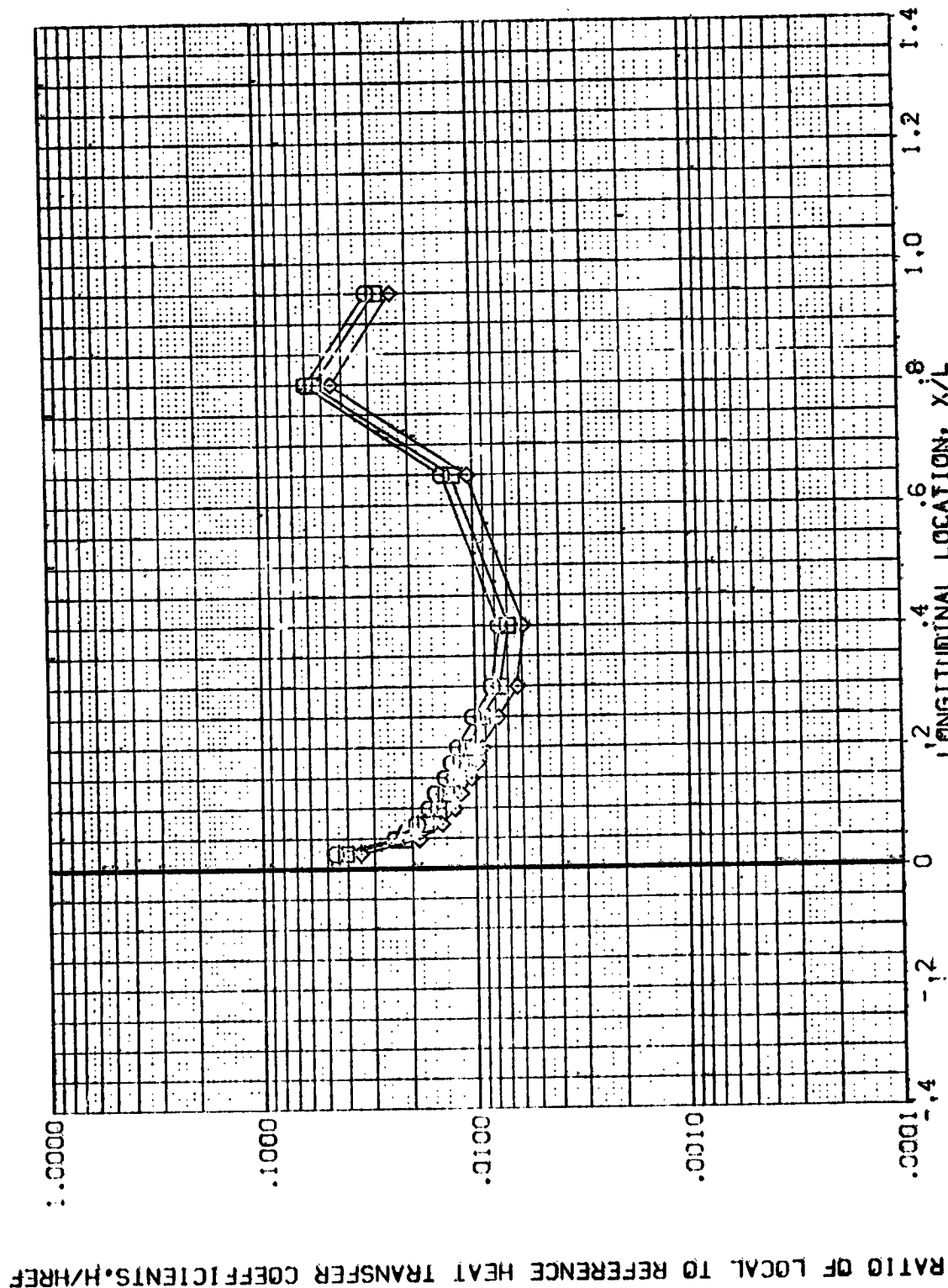


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(REVAQ2)

SYMBOL	HAW/LT	BP	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
□	.850	117.000	5.219	30.000	1.000
◇	.950				
	1.000				

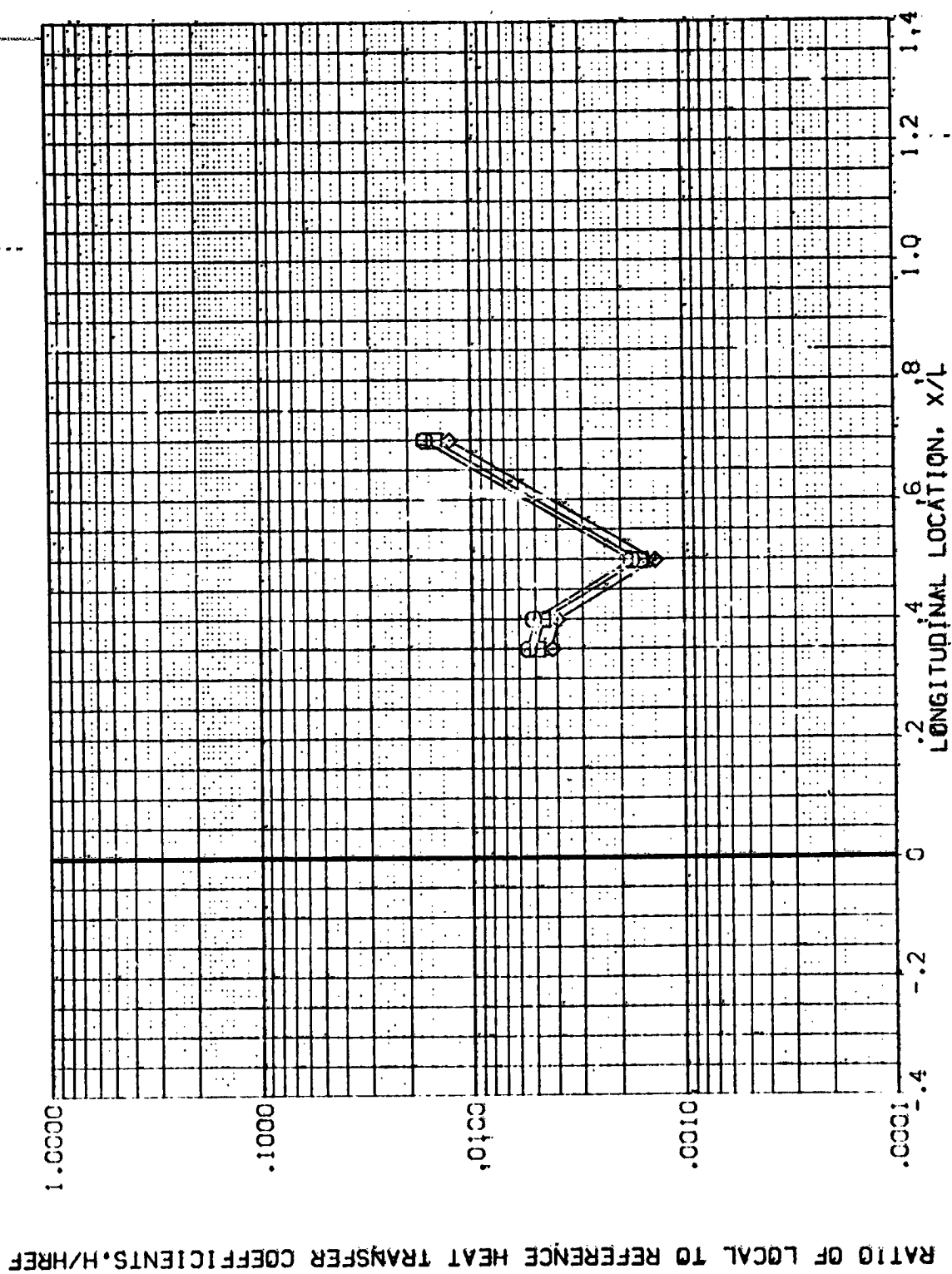


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AVES 3,5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(REVA03)

S.W.C. 1.000  
 MACH 5.220  
 BP .000  
 .850  
 .900

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 1.000  
 .000

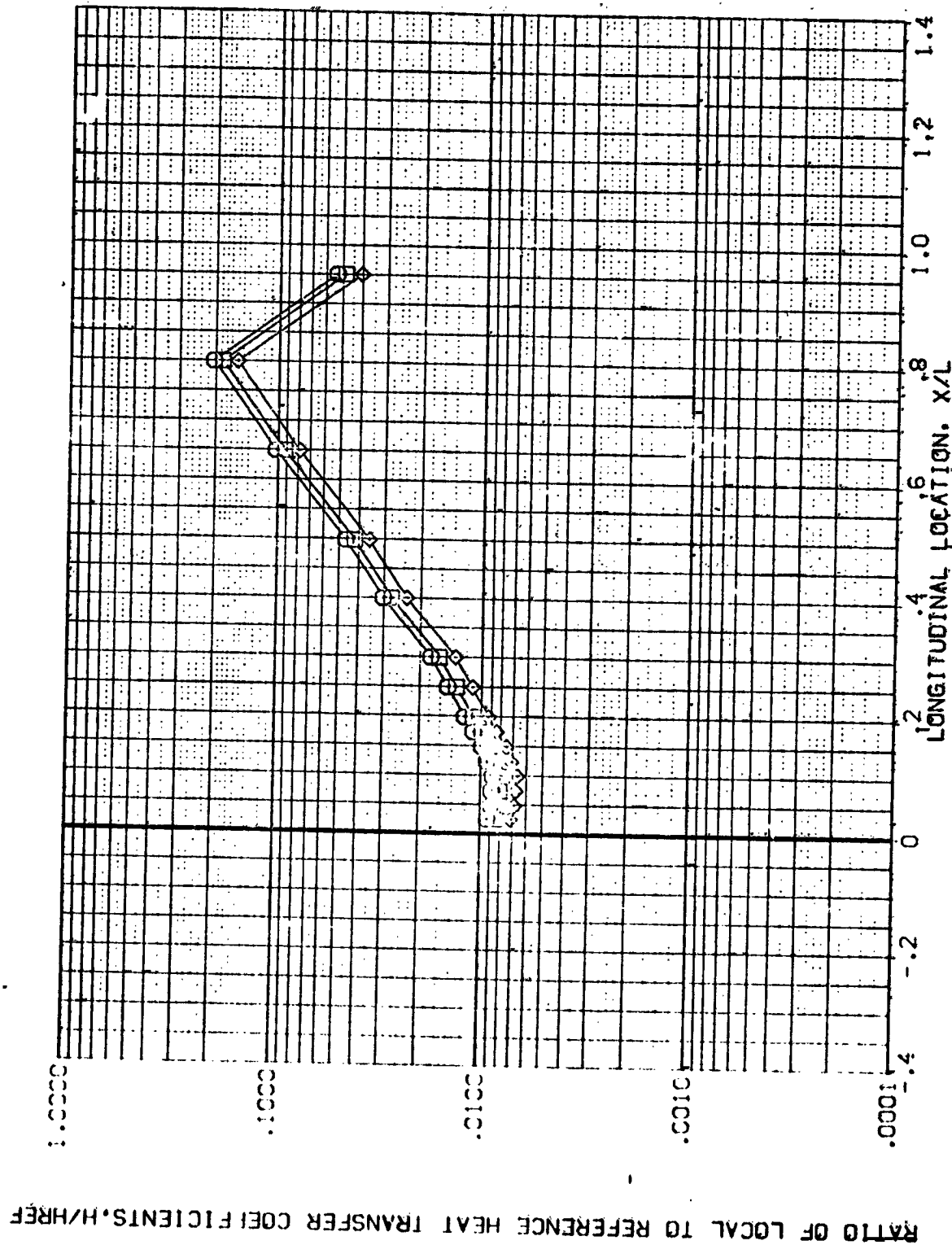


FIG. 8 ORBITER UNDERSIDE FUSELAGE. ORBITER IN THE PRESENCE OF THE TANK

AVES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(REVA03)

SYMBOL HAW/LT BP MACH  
 .850 117.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 150.000  
 BETA 1.000  
 RNL .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

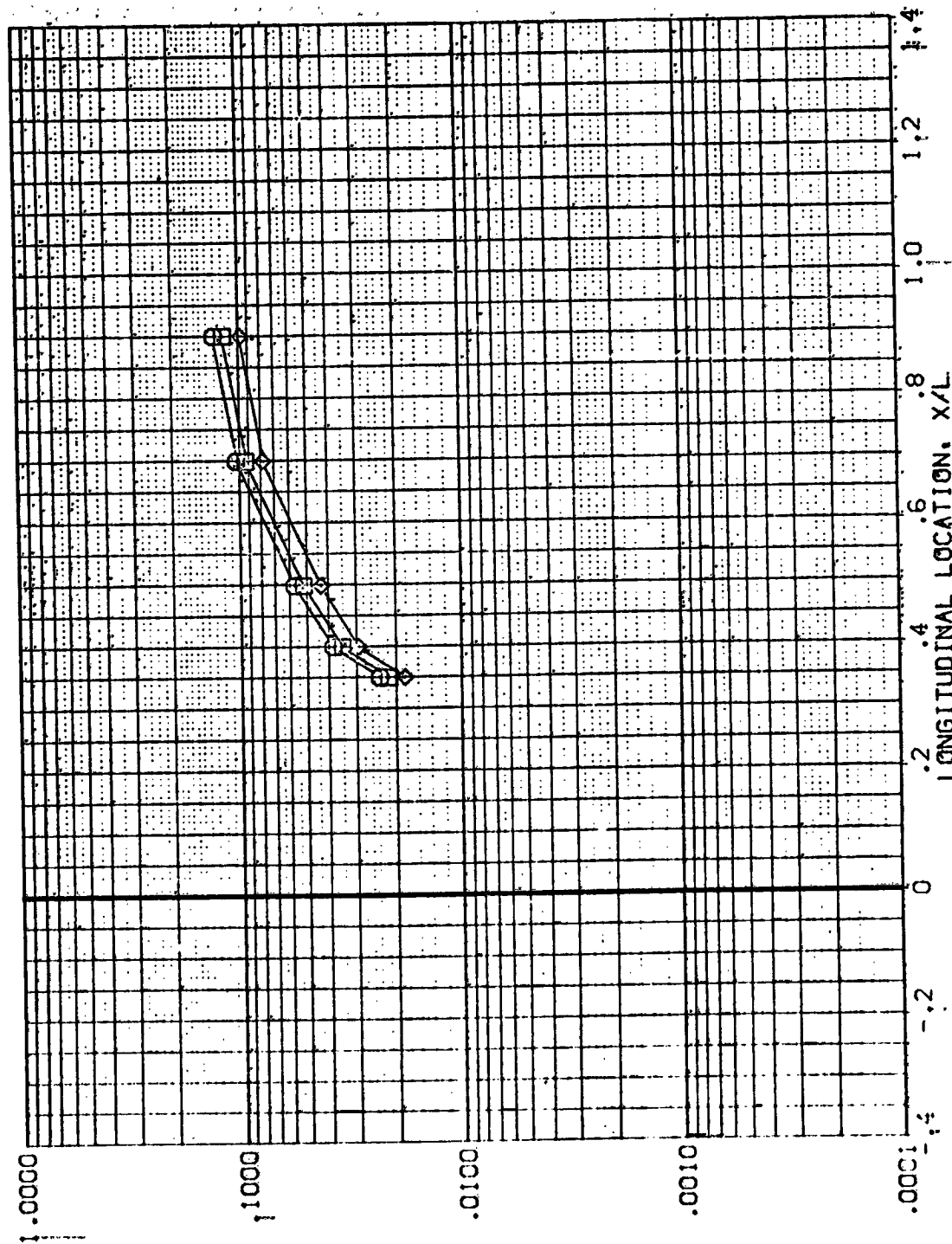


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

REPRODUCIBILITY OF THE  
 ORIGINAL DATA IS POOR

# AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA04)

SYMBOL	MAW/4T	BP	MACH	PARAMETRIC VALUES
◇	.850	.000	5.219	SQ.000
□	.900			BETA
	1.000			1.000

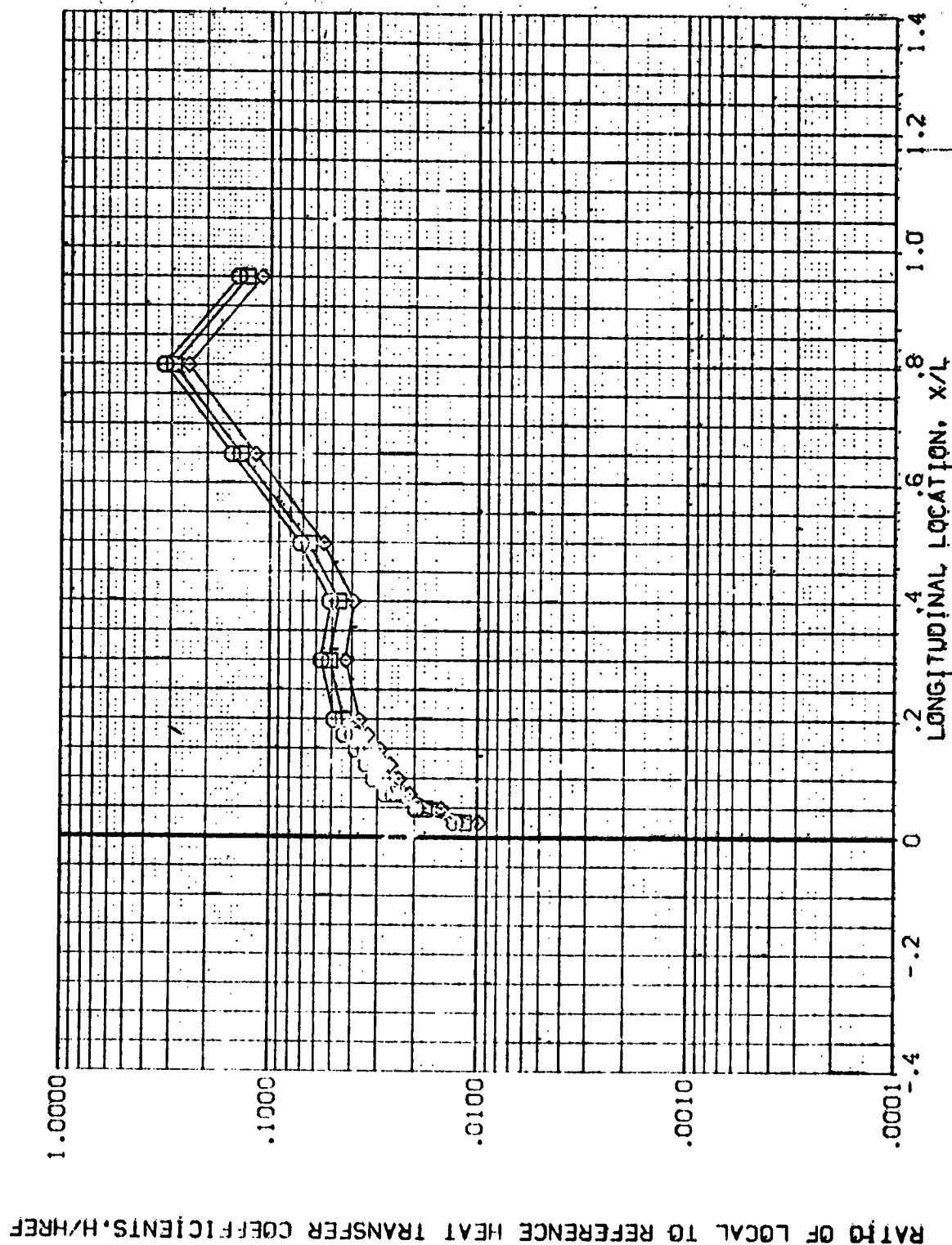


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AMES 3.5-195 1428 01+T1 UNDERSIDE FUSELAGE (REVA04)

SYMBOL    HAW/HT    BP    MACH

□    .850    117.000    5.219

◇    .900    1.000

PARAMETRIC VALUES

ALPHA    90.000°    BETA

RA/L    1.000

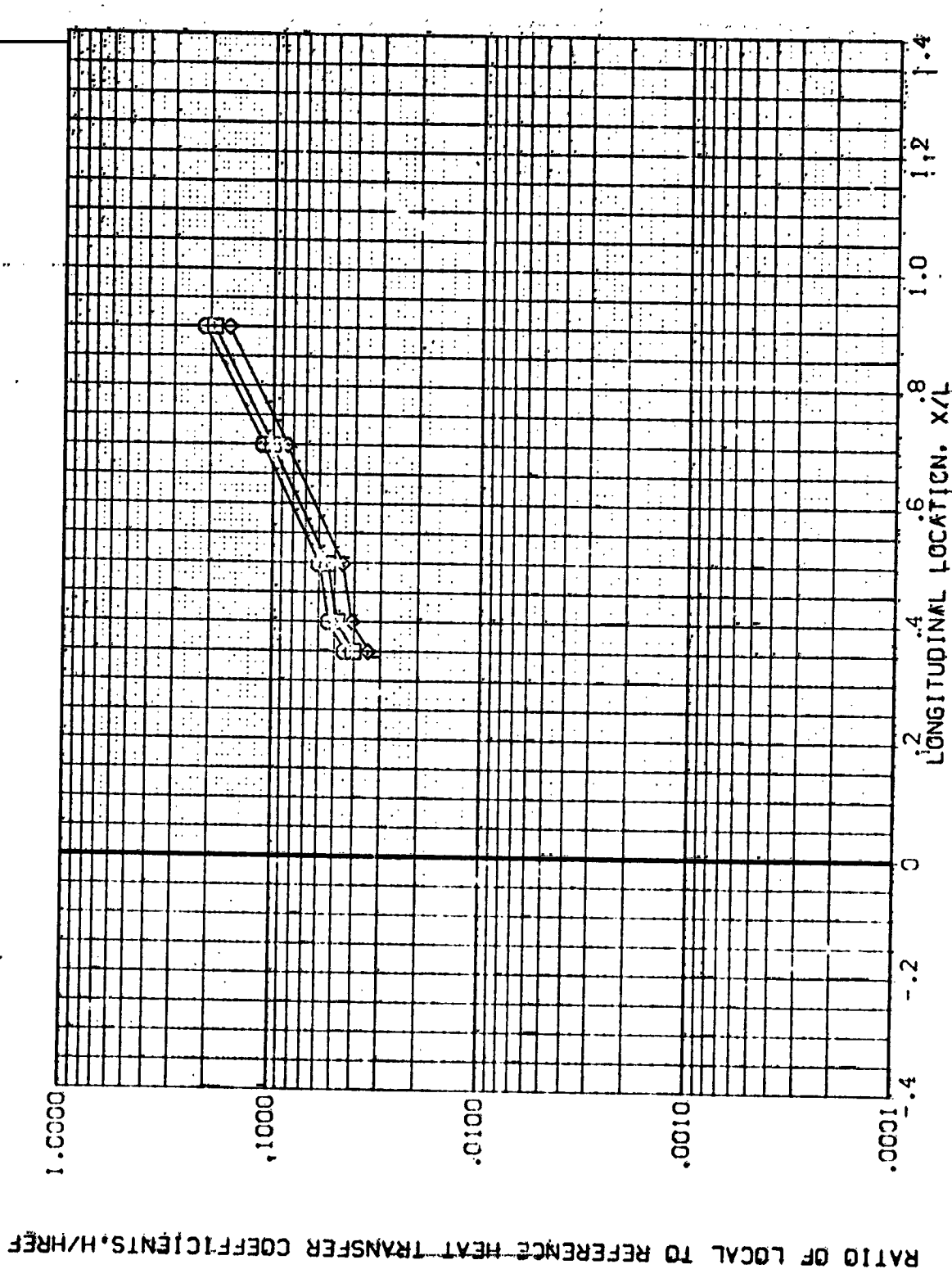


FIG. 8 ORBITER UNDERSIDE FUSELAGE. ORBITER IN THE PRESENCE OF THE TANK



# AVES 3.5-195 IH28 G1+T1 UNDERSIDE FUSELAGE (REVA05)

SYMBOL	HA/WHT	BP	MACH	PARAMETRIC VALUES	
	.850	.000	5.220	ALPHA	120,000 BETA
	.900			RM/L	1,000
	1.000				.000

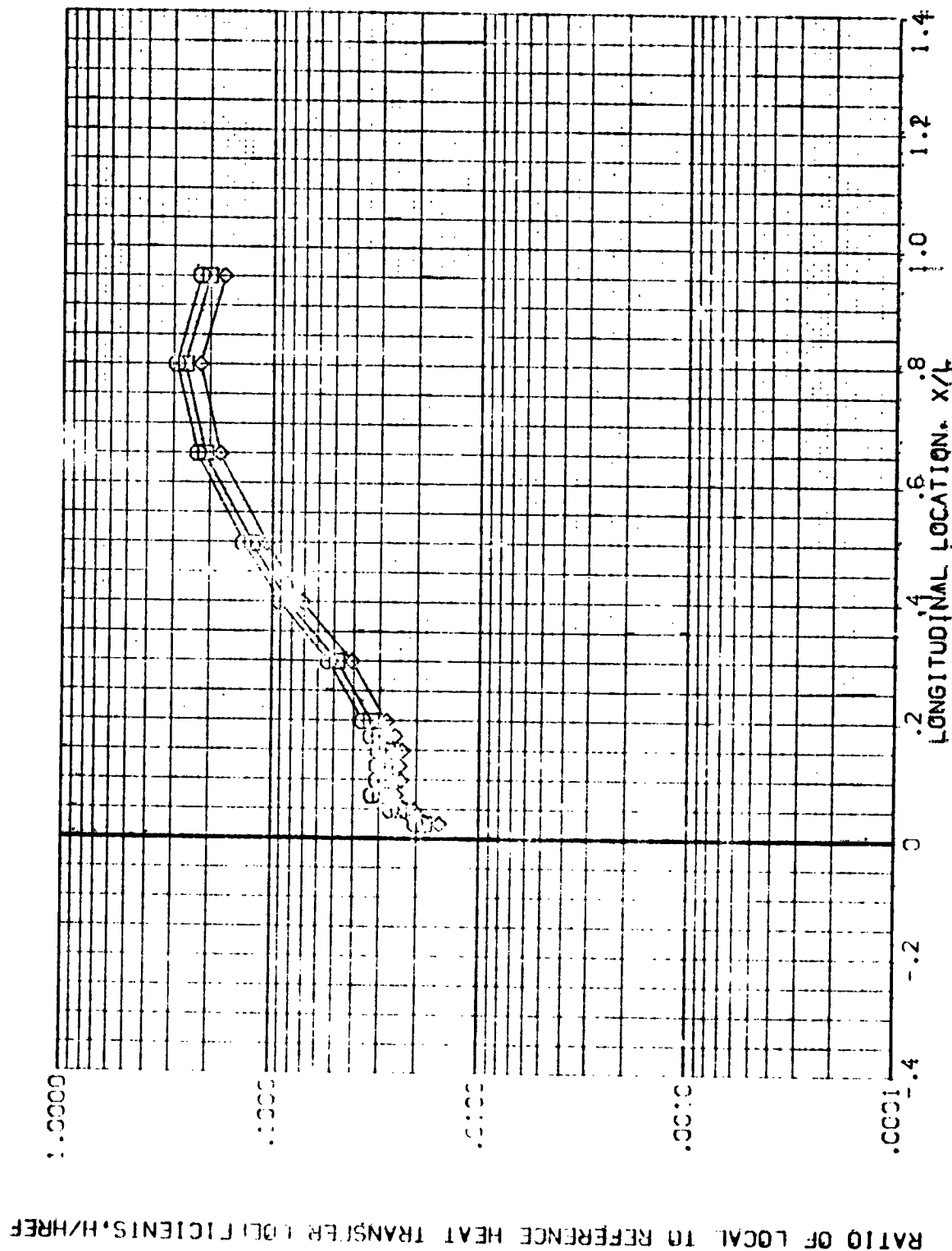


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 UNDERSIDE FUSELAGE (REV A05J)

SYMBOL	MAW/MT	BP	MACH	PARAMETRIC VALUES
◇	.850	1:17.000	5.220	ALPHA
□	.900			120.000
	1.000			BETA
				1.000
				.000

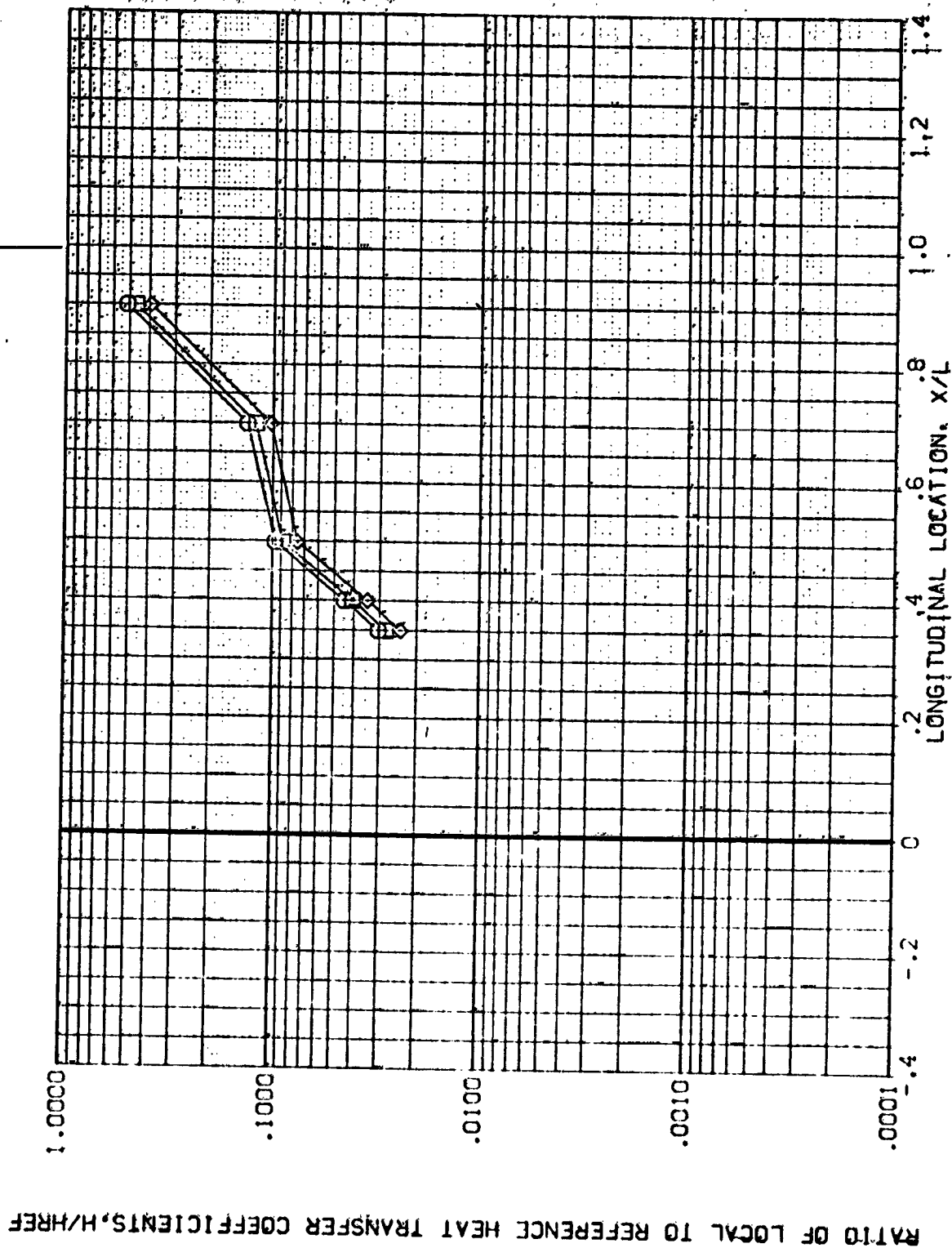


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AVES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA06)

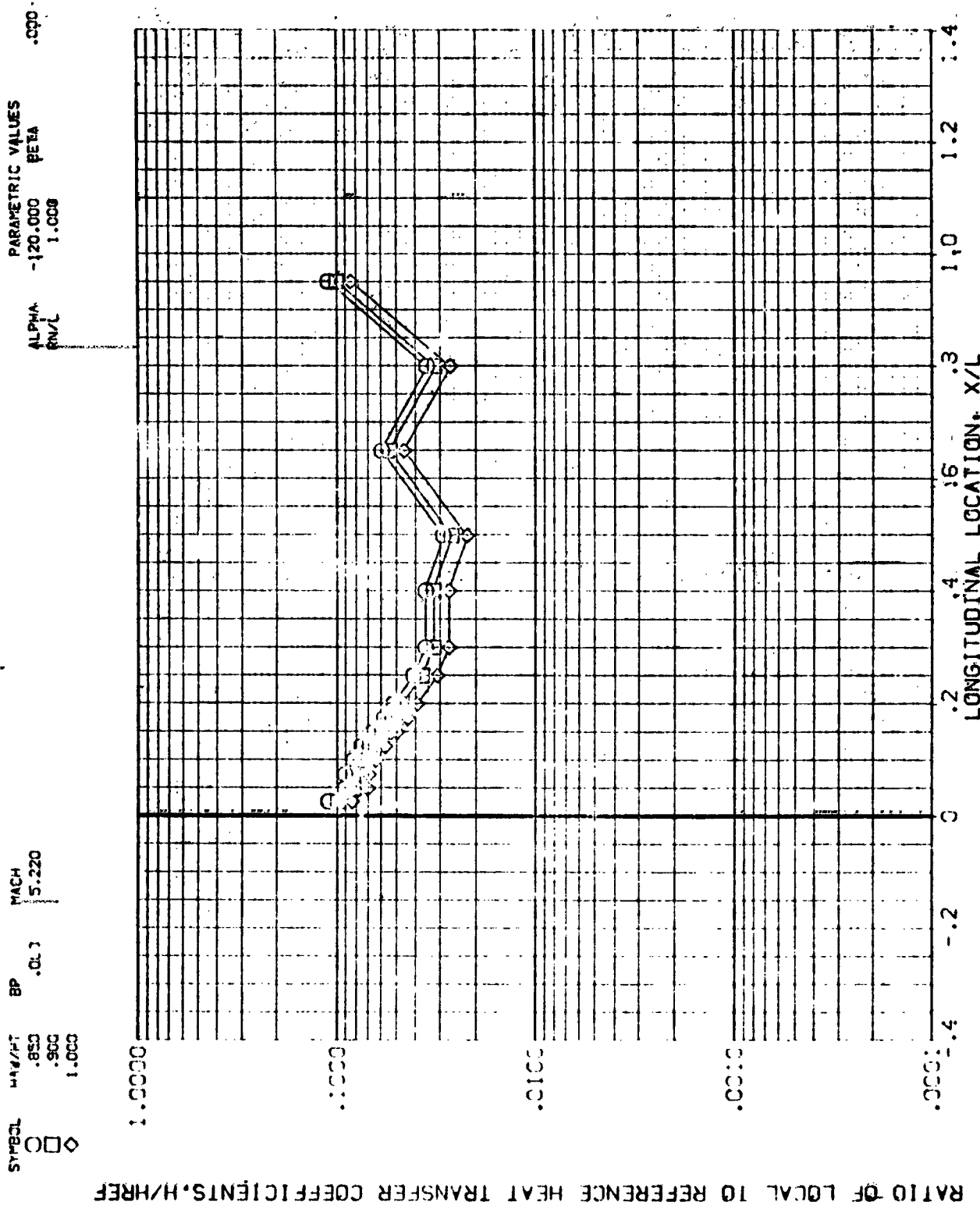


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AVES 3,5-195 IH28 C1+T1 UNDERSIDE FUSELAGE (REVA06)

SYMBOL HEIGHT BP MACH  
 ◇ .850 117.000 5.220  
 □ .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BET.  
 BN/L 1.000

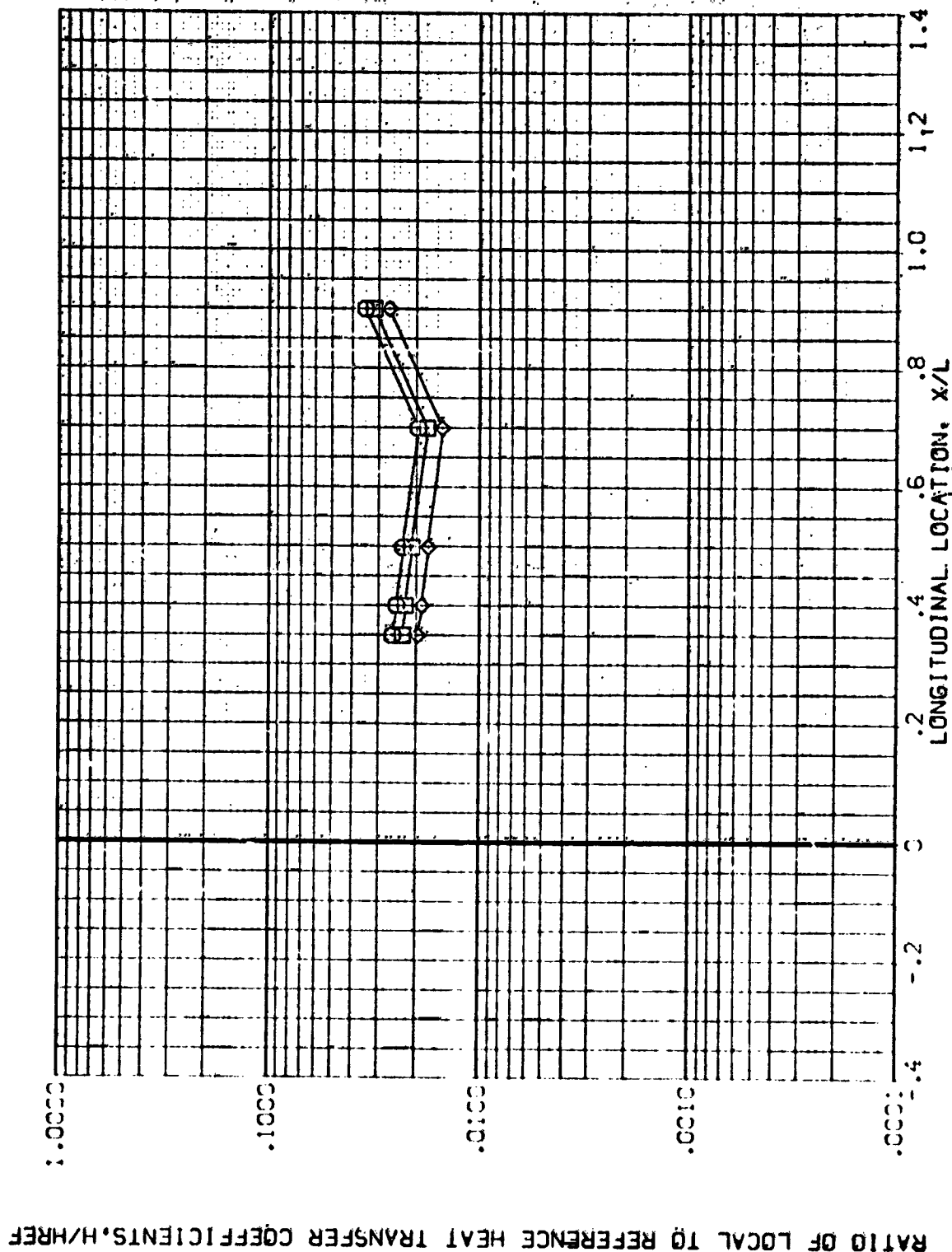


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

5-22	MAW/P	80	MACH	PARAMETRIC VALUES
010	.850	.00	5.219	-90.000 BETA .000
	.900			1.000 PNL
	1.000			

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

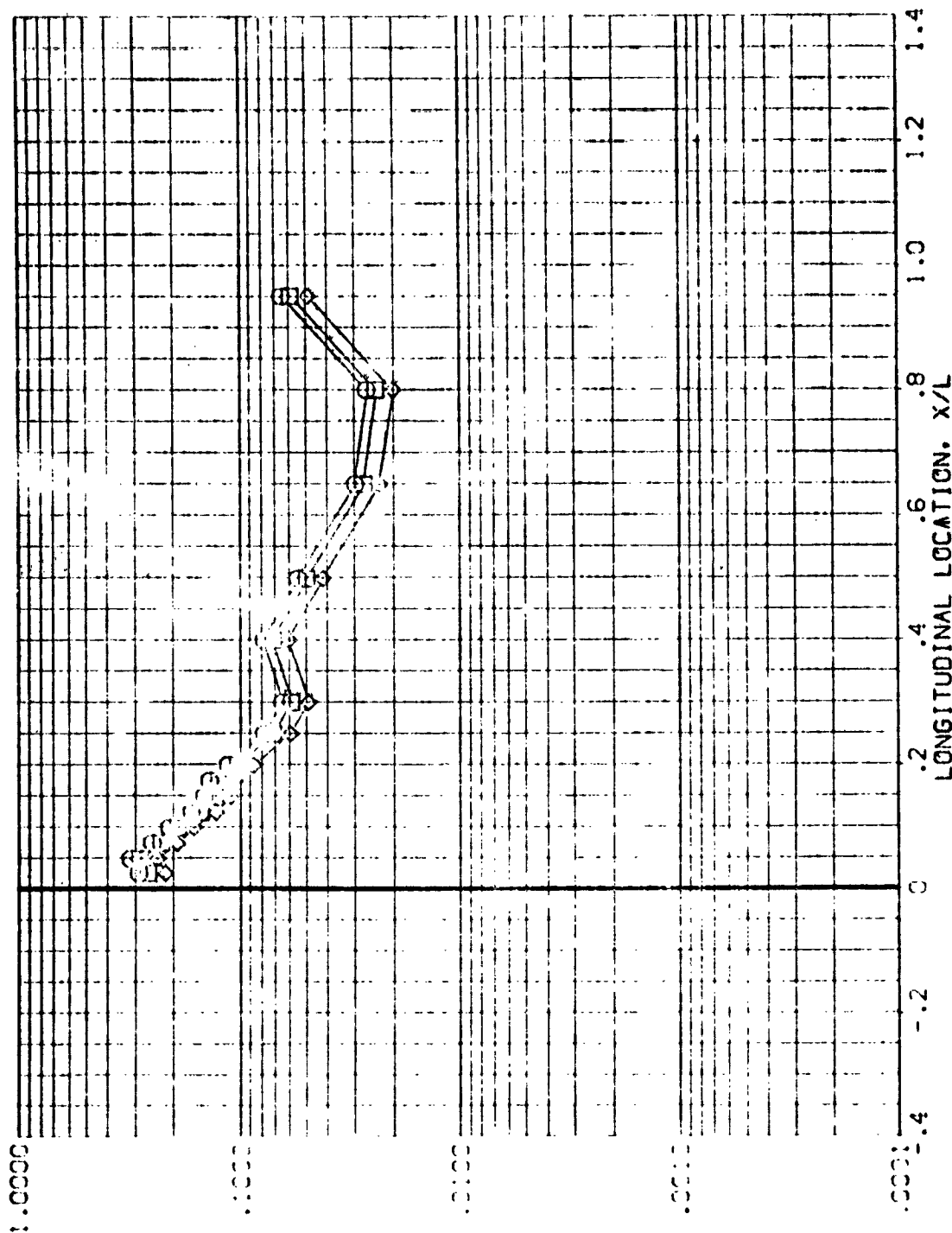


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE

(REVA07)

SYNOPSIS  
 WASH/HT .850  
 BP 117.000  
 MACH 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000  
 RV/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

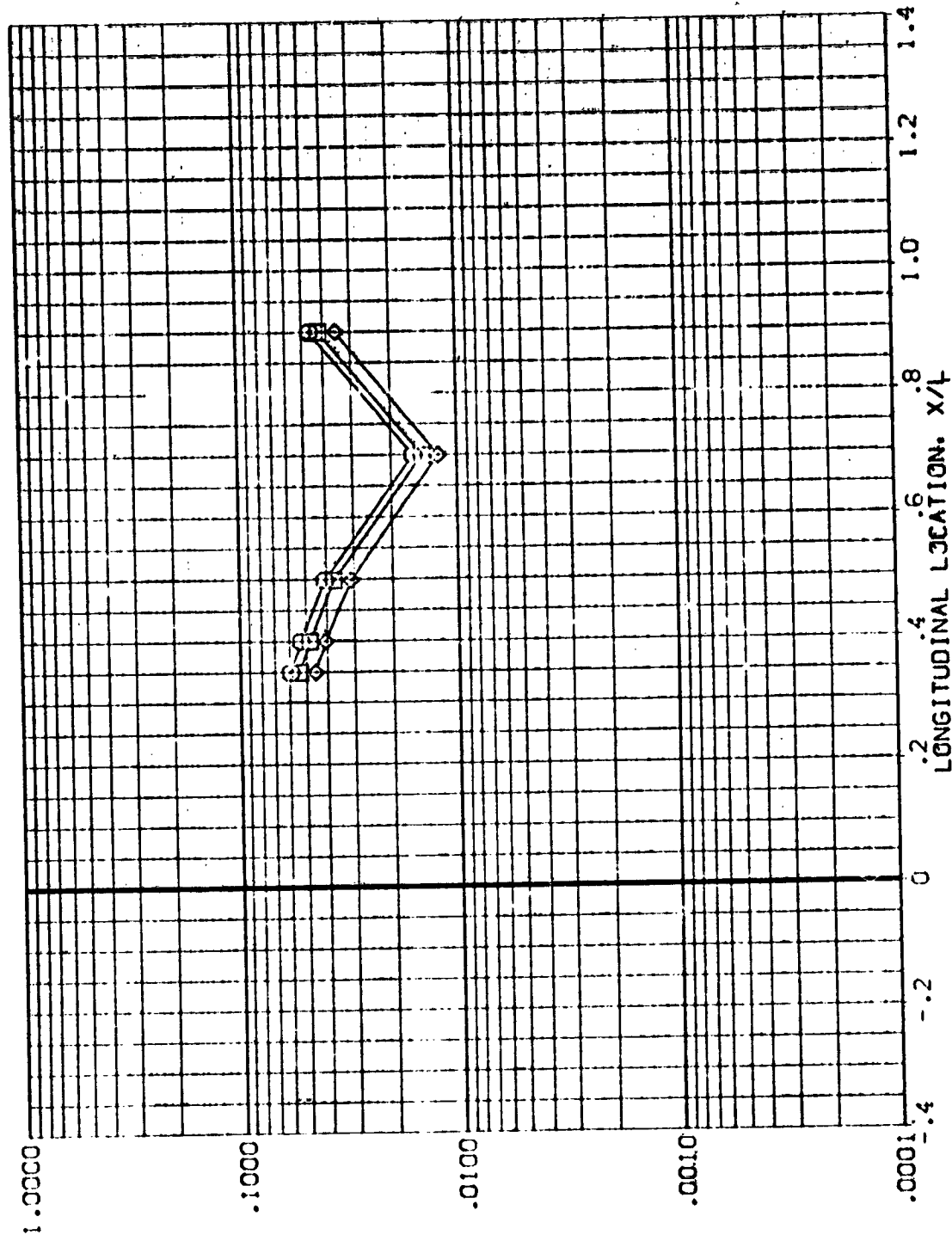


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

5-220	MAY 7	BP	MACH
000	.850		5-220
000	-500		
000	+000		

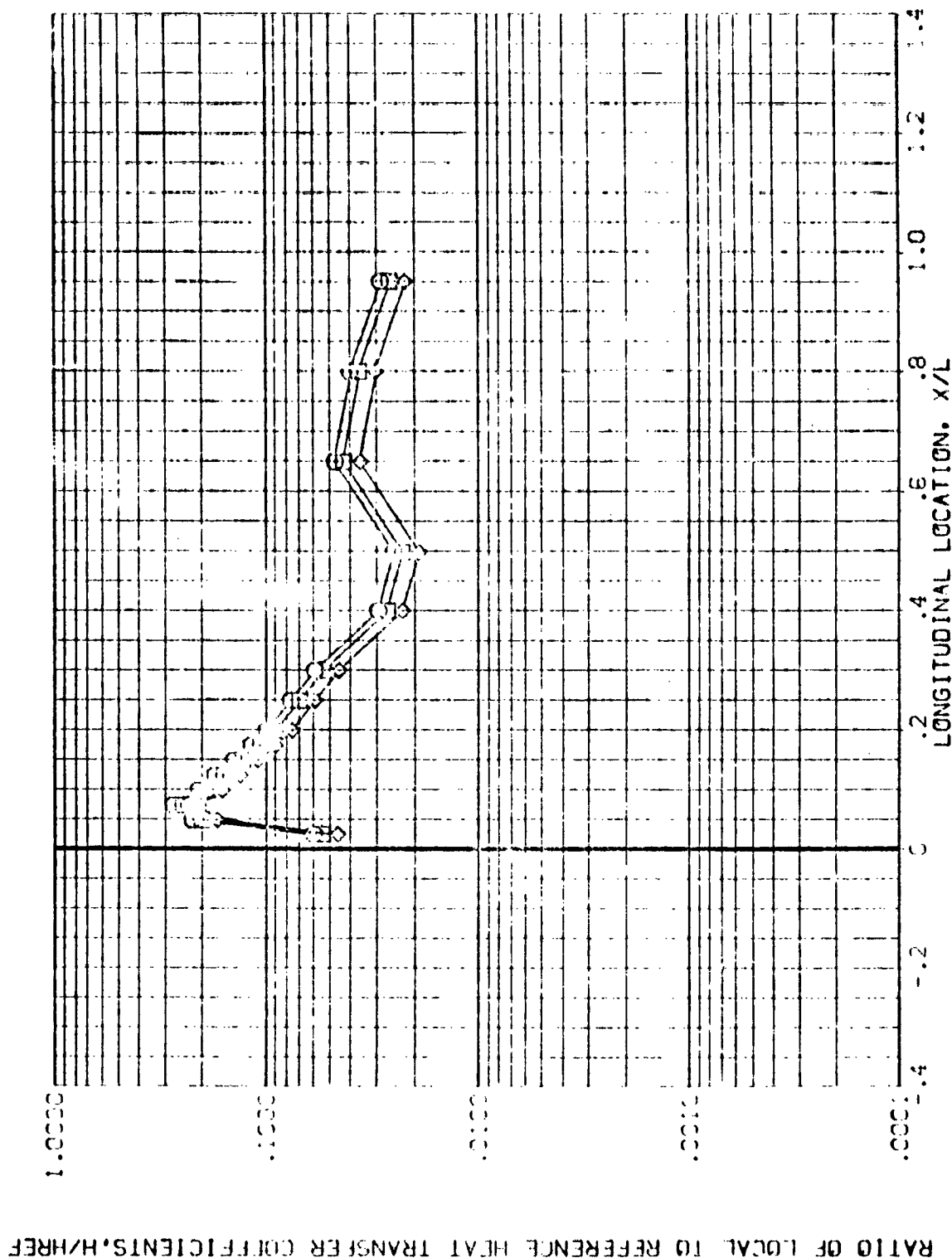


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 UNDERSIDE FUSELAGE

(REVA08)

SYMBOL  
◇ □

MAV/HT  
.850  
.900  
1.000

BP

117.000

MACH  
5.220

ALPHA  
RN/L

PARAMETRIC VALUES  
TSO.000  
1.000

BETA  
.000

--- RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

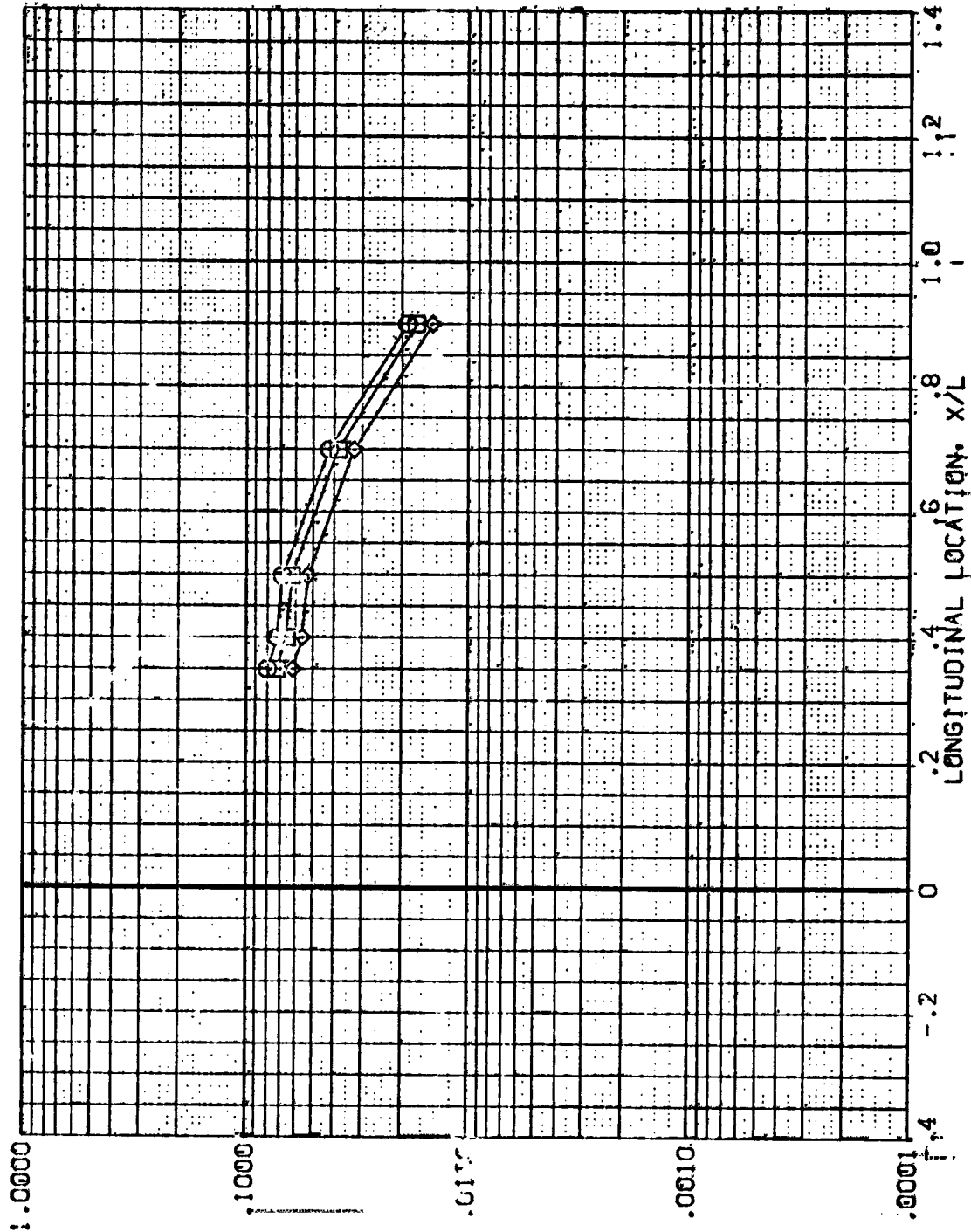


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK



(REV A09)

BP 1.000 MACH. 5.220

ALPHA	PARAMETRIC VALUES
RN/L	BETA
	-30.000
	1.000

FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3,5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA009)

SYMBOL MAY/HT BP MACH  
 1950 117.000 5.220  
 1950 1.000

PARAMETRIC VALUES  
 ALPHA RMVT  
 -30.000 1.000  
 BETA

0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

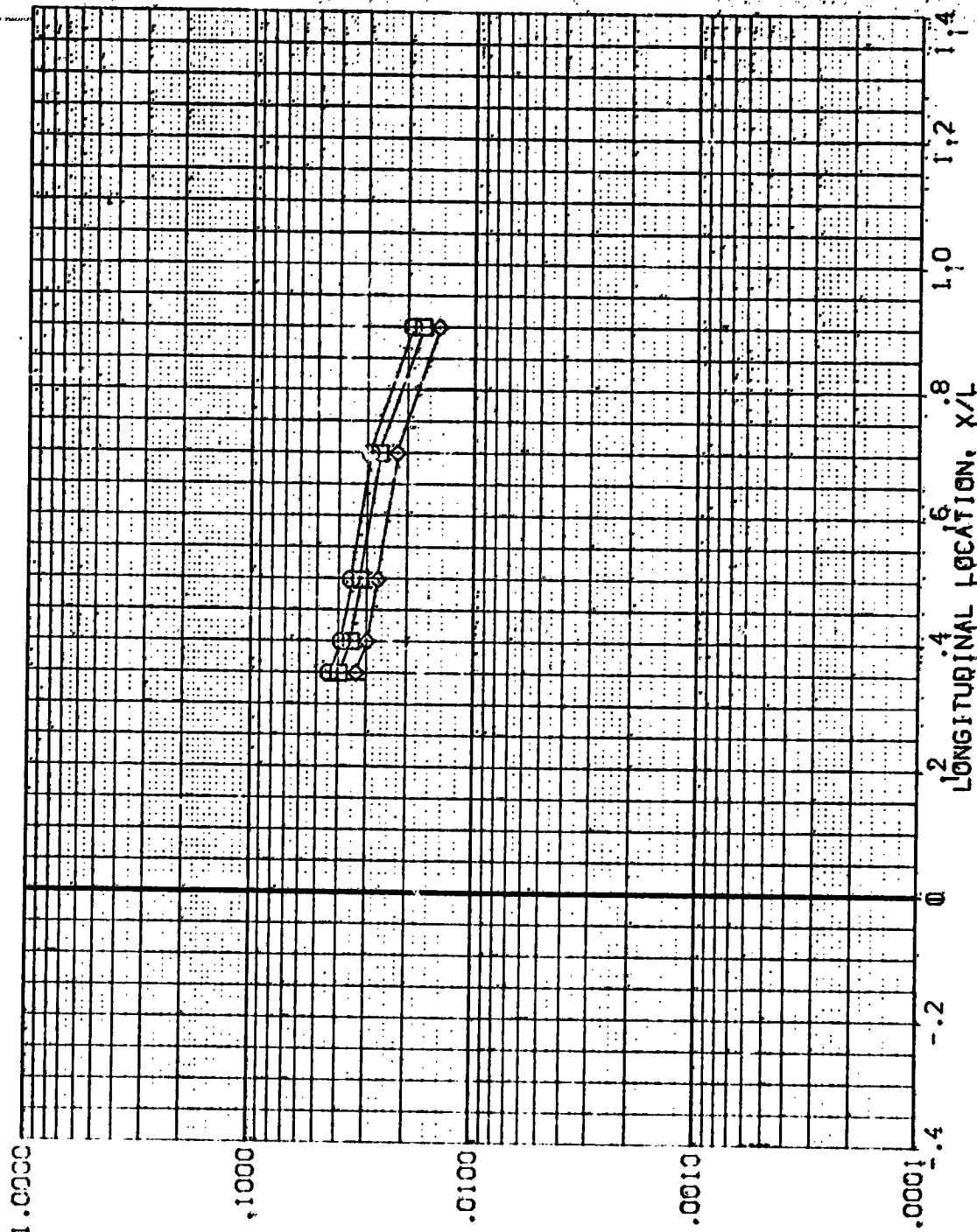


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AMES 3,5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA10J)

SYMBOL	HAU/HT	BP	MACH	PARAMETRIC VALUES
◇	.850	.000	5.299	50.060
□	.900			BETA
	1.000			4.000
				ALPHA
				RMVT

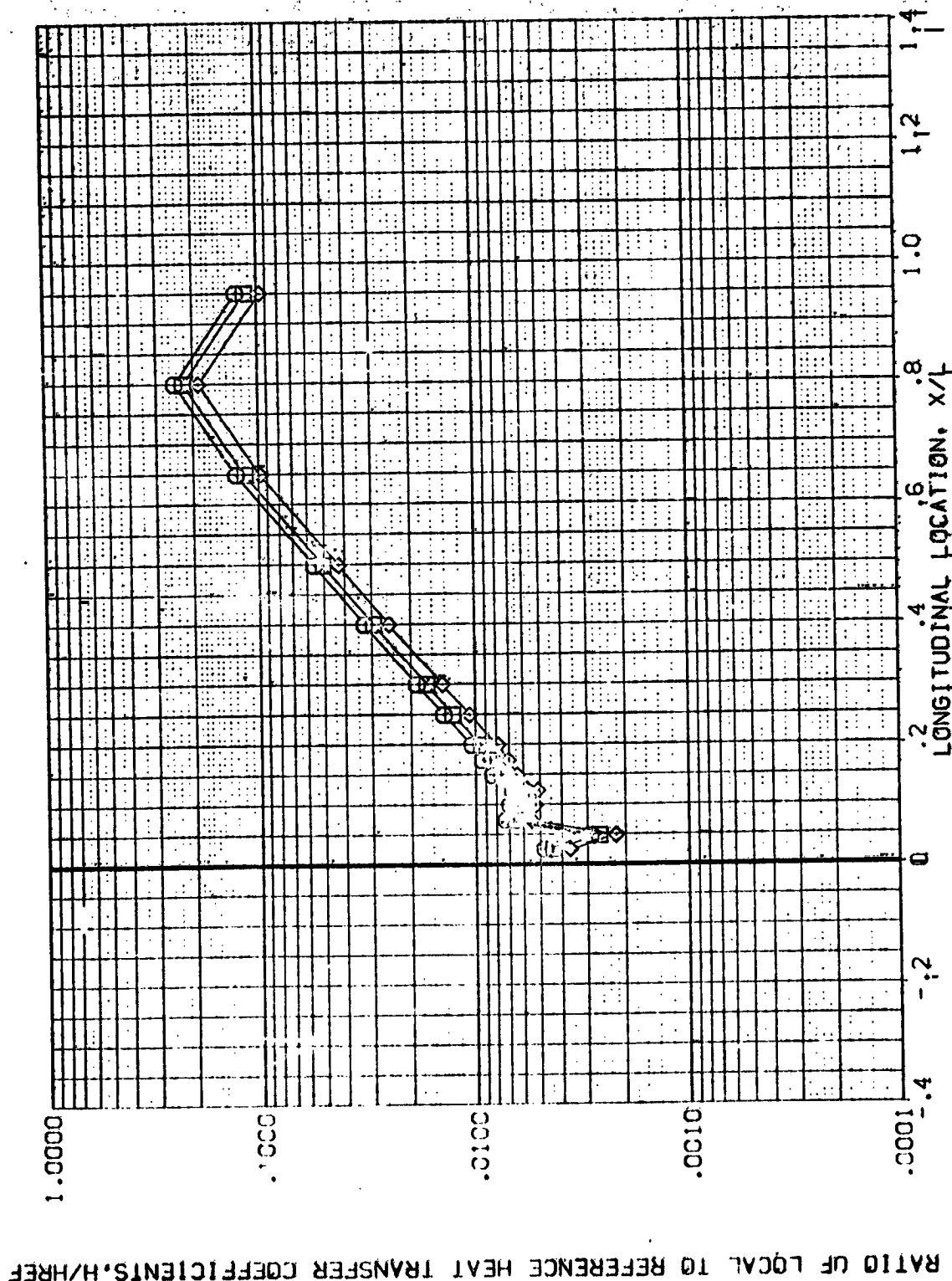


FIG. 8 ORBITER UNDERSIDE FUSELAGE. ORBITER IN THE PRESENCE OF THE TANK

AMES 3,5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA10)

SYMBOL  
☐  $\square$   
☐  $\diamond$

MAX/WT BP MACH  
 .85C 117.008 5.299  
 .90C  
 1.000

PARAMETRIC VALUES  
 ALPHA .  
 RNU/L 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

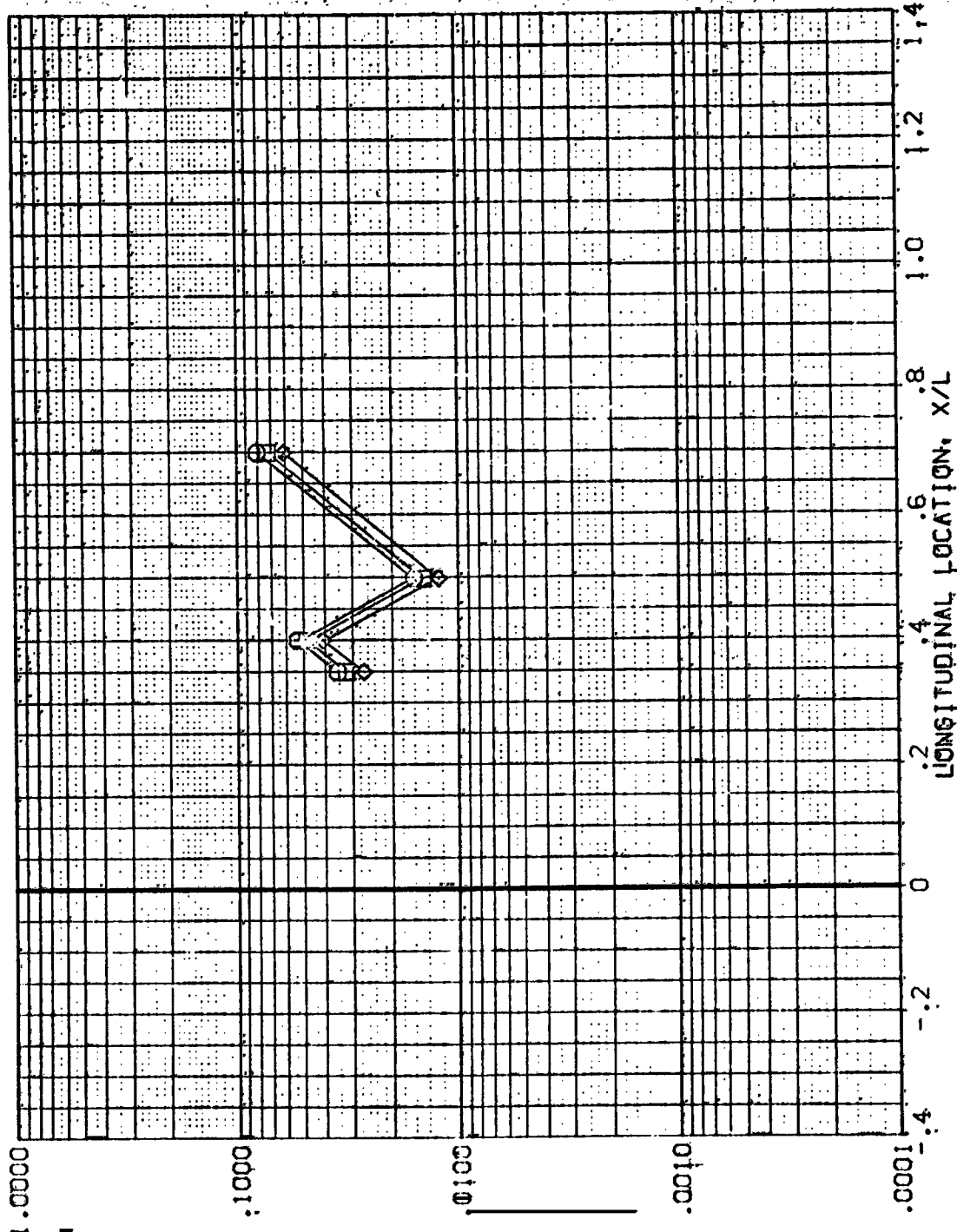


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+71 UNDERSIDE FUSELAGE (REVA11)

PARAMETRIC VALUES  
 ALPHA 30.000 BETA .000  
 RN/L 4.000

SYMBOL MAX/HT BP MACH  
 □ .850 .000 5.300  
 ◇ .900 .000 5.300  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

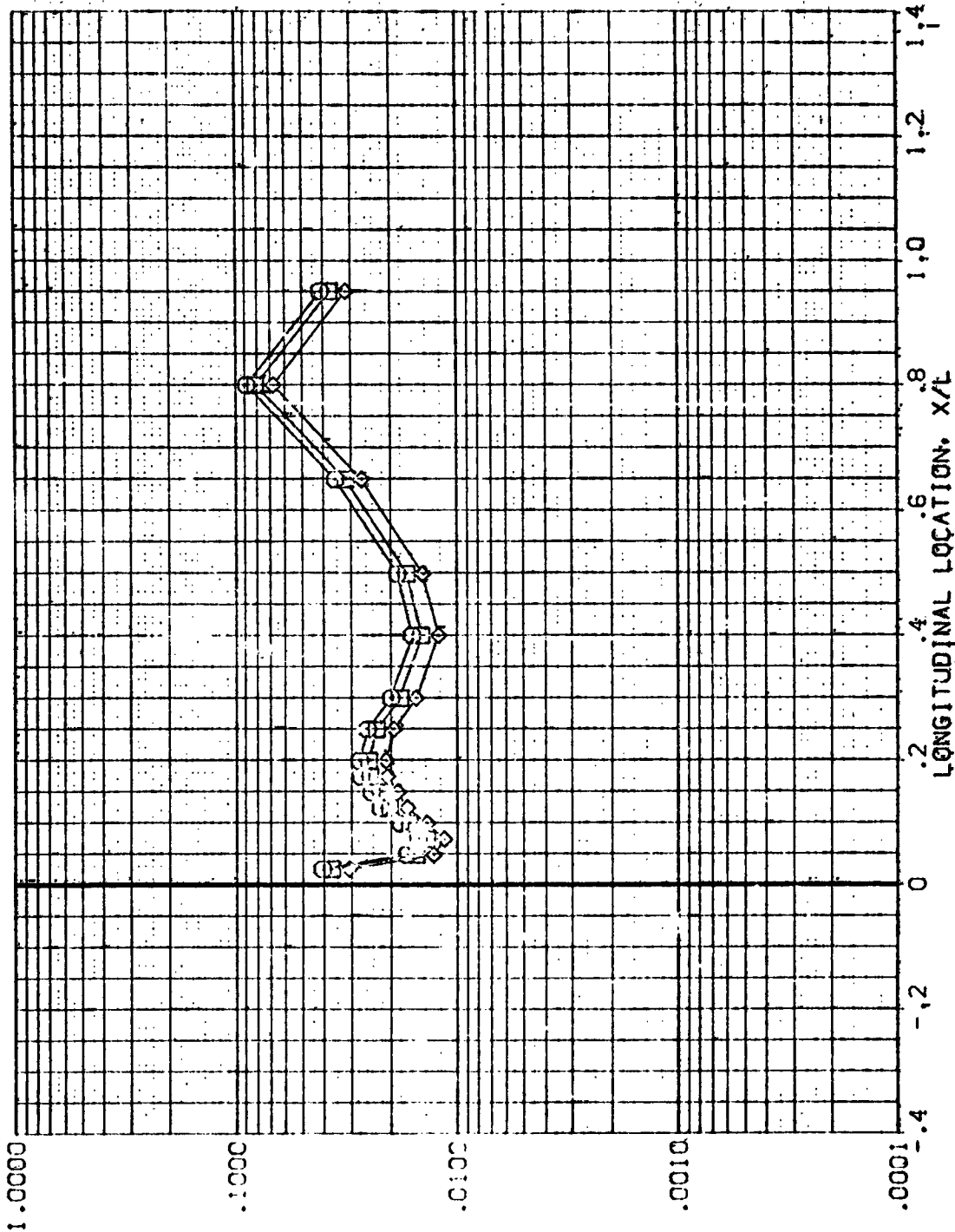


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-135 IH28 01+T1 UNDERSIDE FUSELAGE (REV. 11)

PARAMETRIC VALUES  
 30.000 BETA  
 4.000

ALPHA  
 RN/L

BP MACH  
 117.000 5.300  
 .850  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

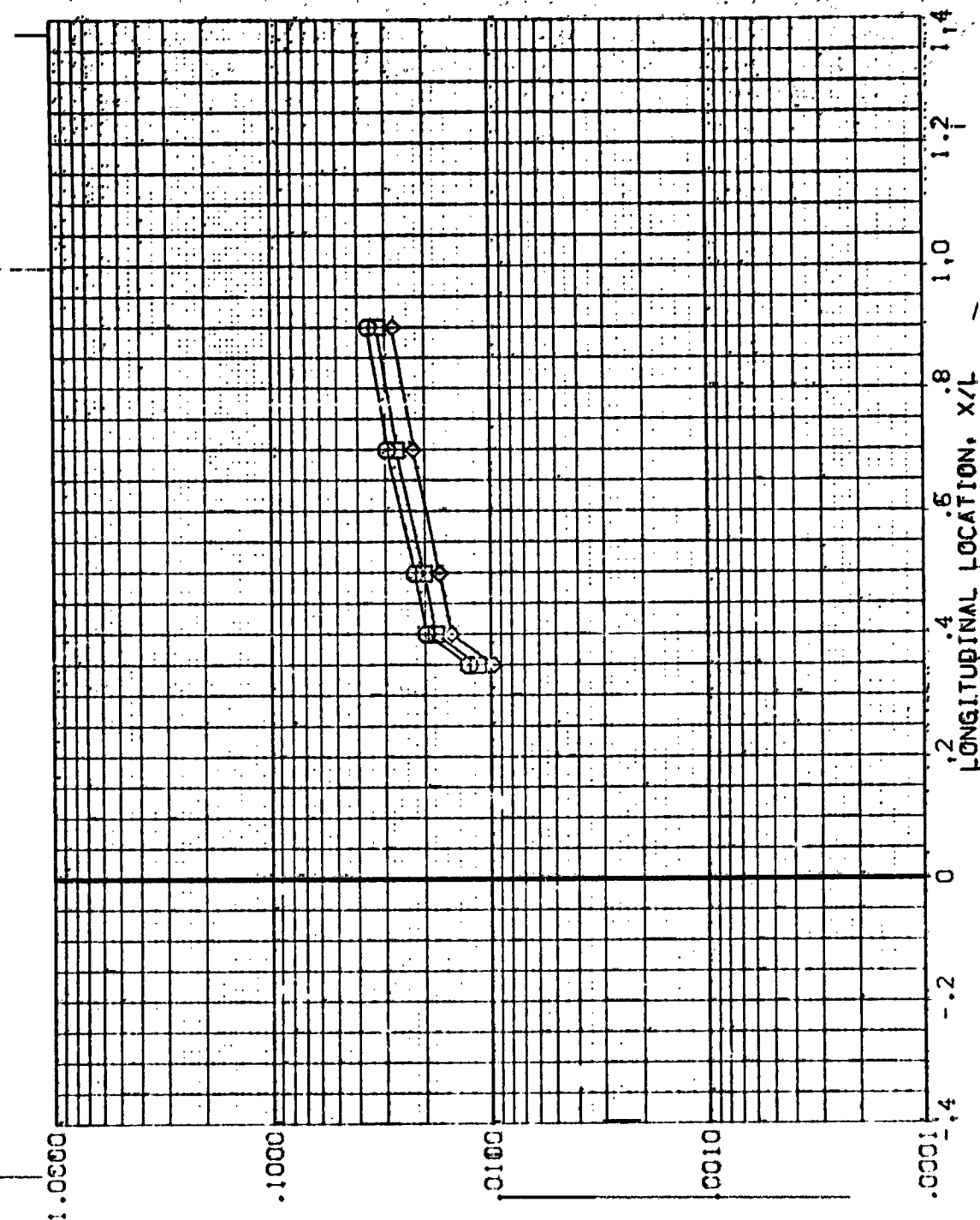


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

# AYES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE (REVA12)

SYMBOL	MAW/MT	B <sup>2</sup>	MACH	PARAMETRIC VALUES
◇	.850	.000	5.220	ALPHA 30.000
□	.900			BN/L 1.000
◇	1.000			BETA -5.000

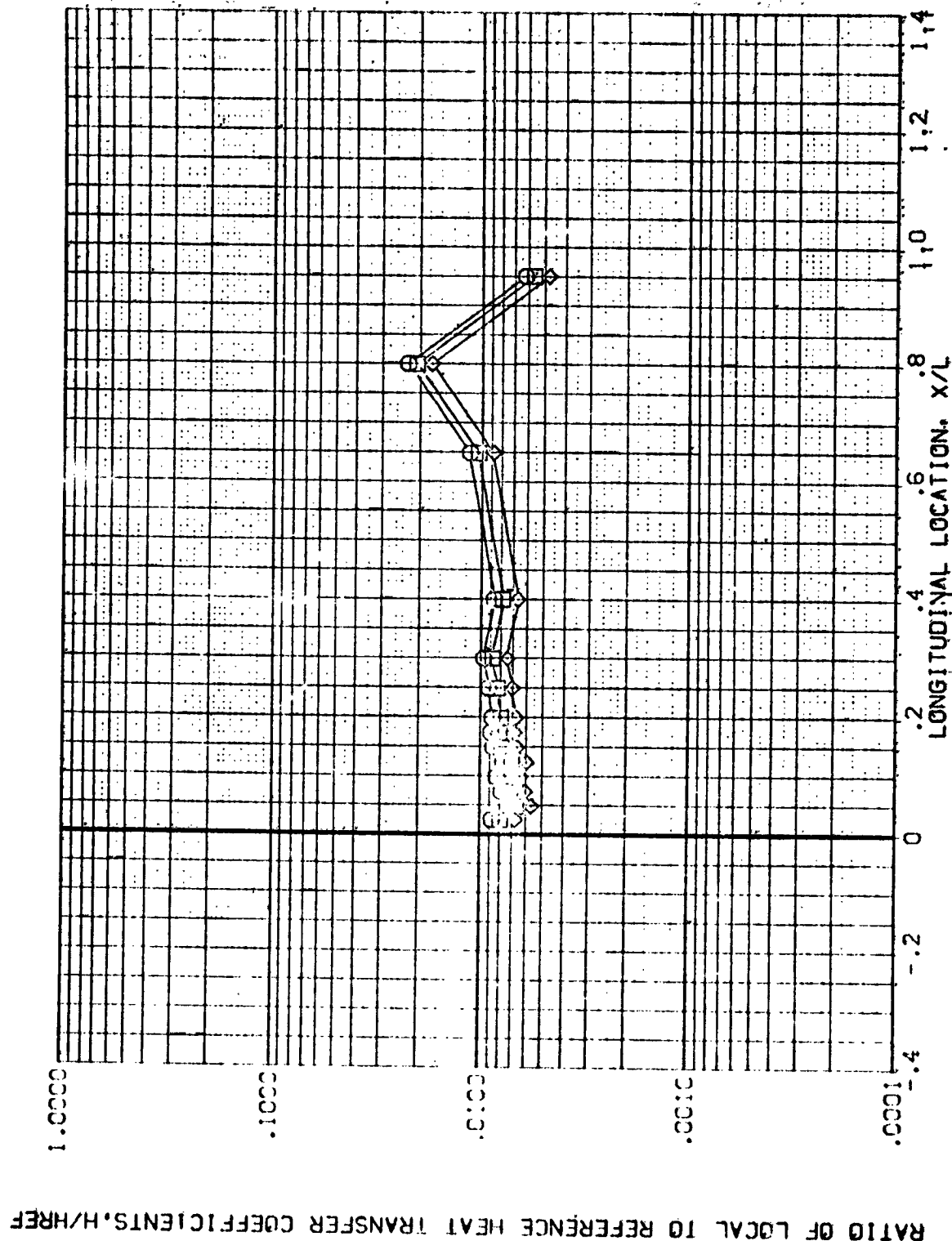


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (REVA12)

SYMBOL	HAW/HT	RD	WICH	PARAMETRIC VALUES	
				ALPHA	PETA
				RN/4	
◇	.850	1.7.000	5.220	30.000	-5.000
□	.900			1.000	
◇	1.000				

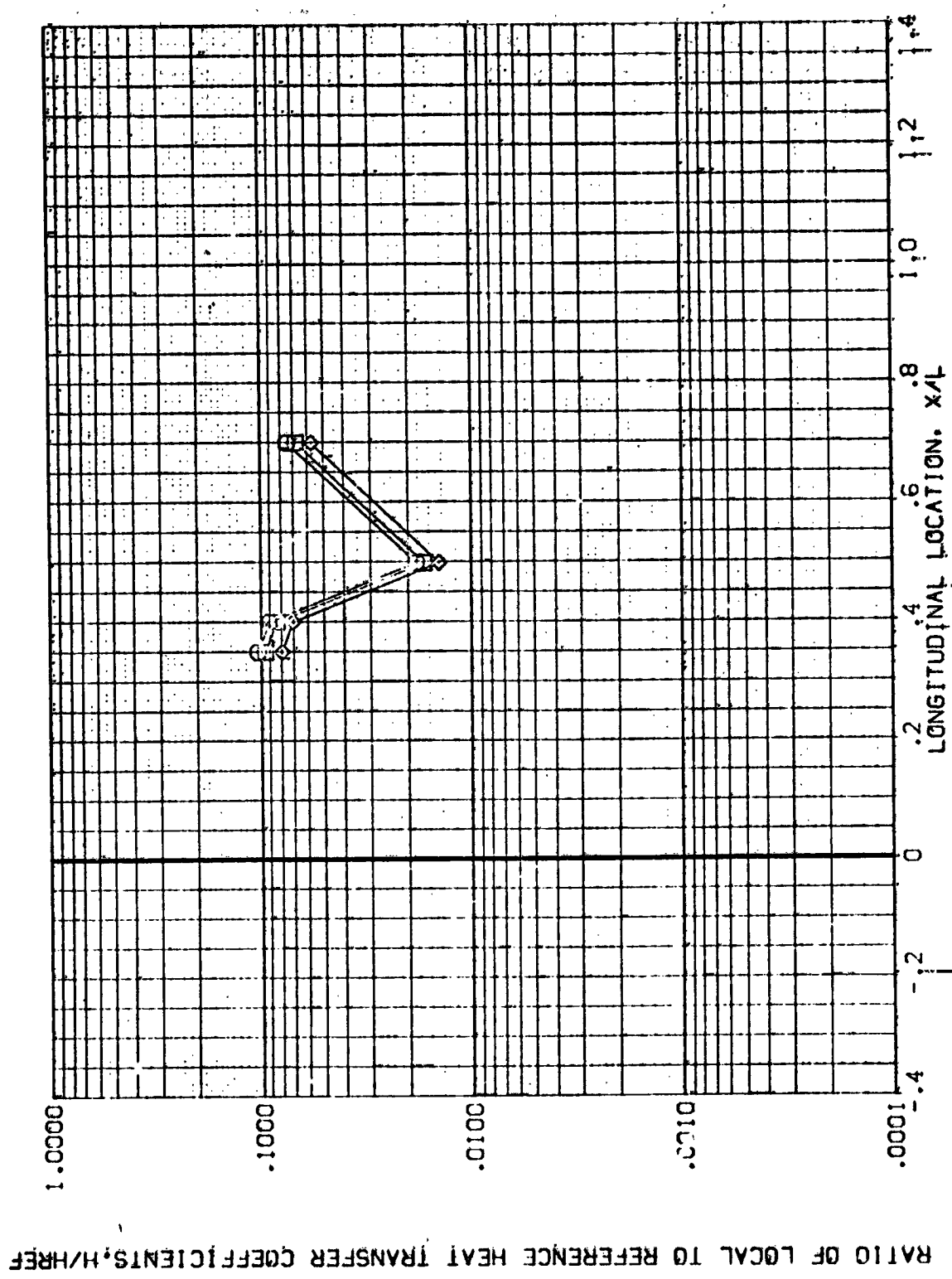


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
RE/011	AMES 3-5-195 1428 01+11 UNDERSIDE FUSELAGE	.000	.000	1.000
RE/012	AMES 3-5-195 1428 01+11 UNDERSIDE FUSELAGE	30.000	.000	1.000
RE/013	AMES 3-5-195 1428 01+11 UNDERSIDE FUSELAGE	60.000	.000	1.000
RE/014	AMES 3-5-195 1428 01+11 UNDERSIDE FUSELAGE	90.000	.000	1.000
RE/015	AMES 3-5-195 1428 01+11 UNDERSIDE FUSELAGE	120.000	.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

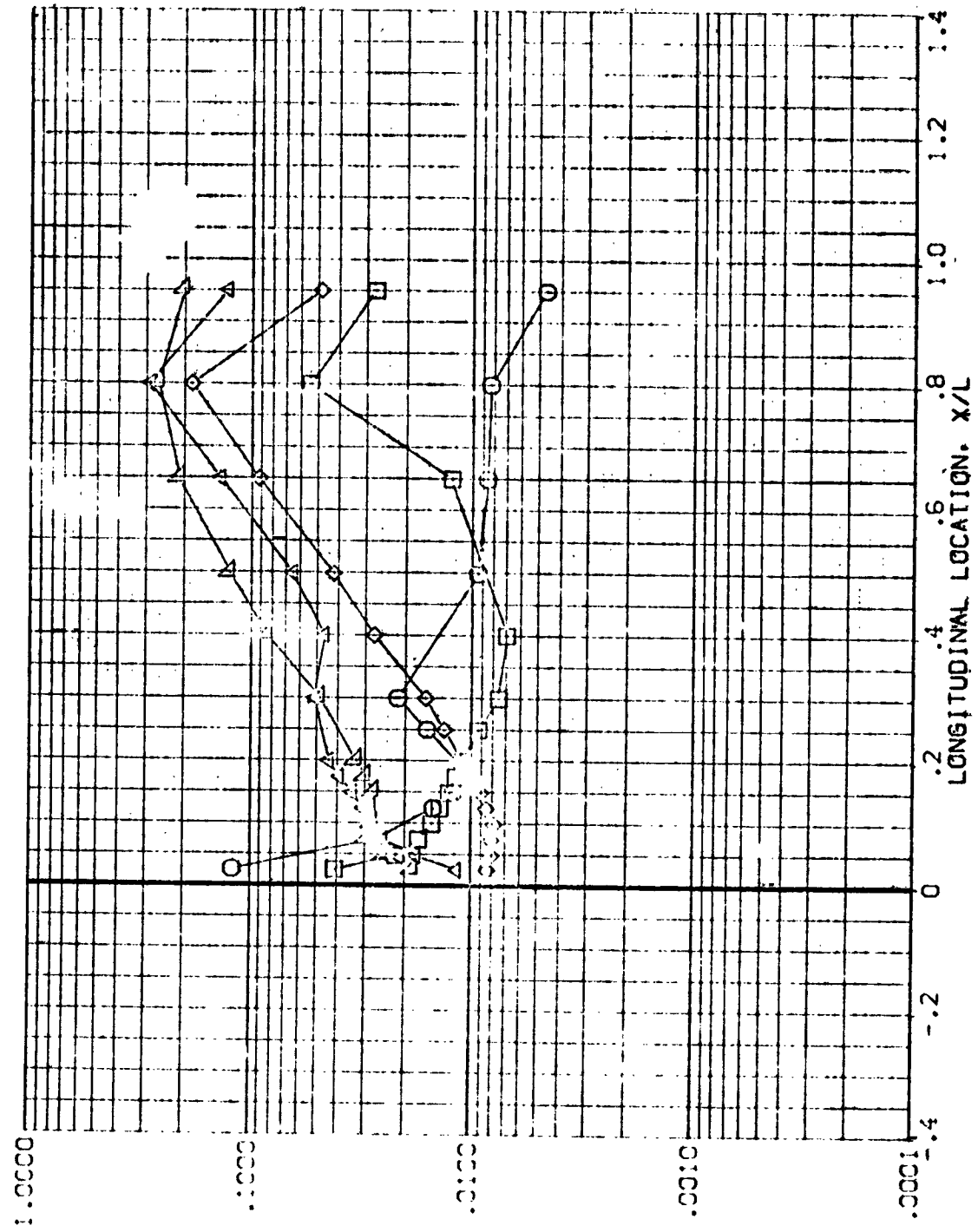


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 BP = .000 PAGE 420

DATA SET SYMBOL

CONFIGURATION DESCRIPTION

ALPHA BETA RV/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

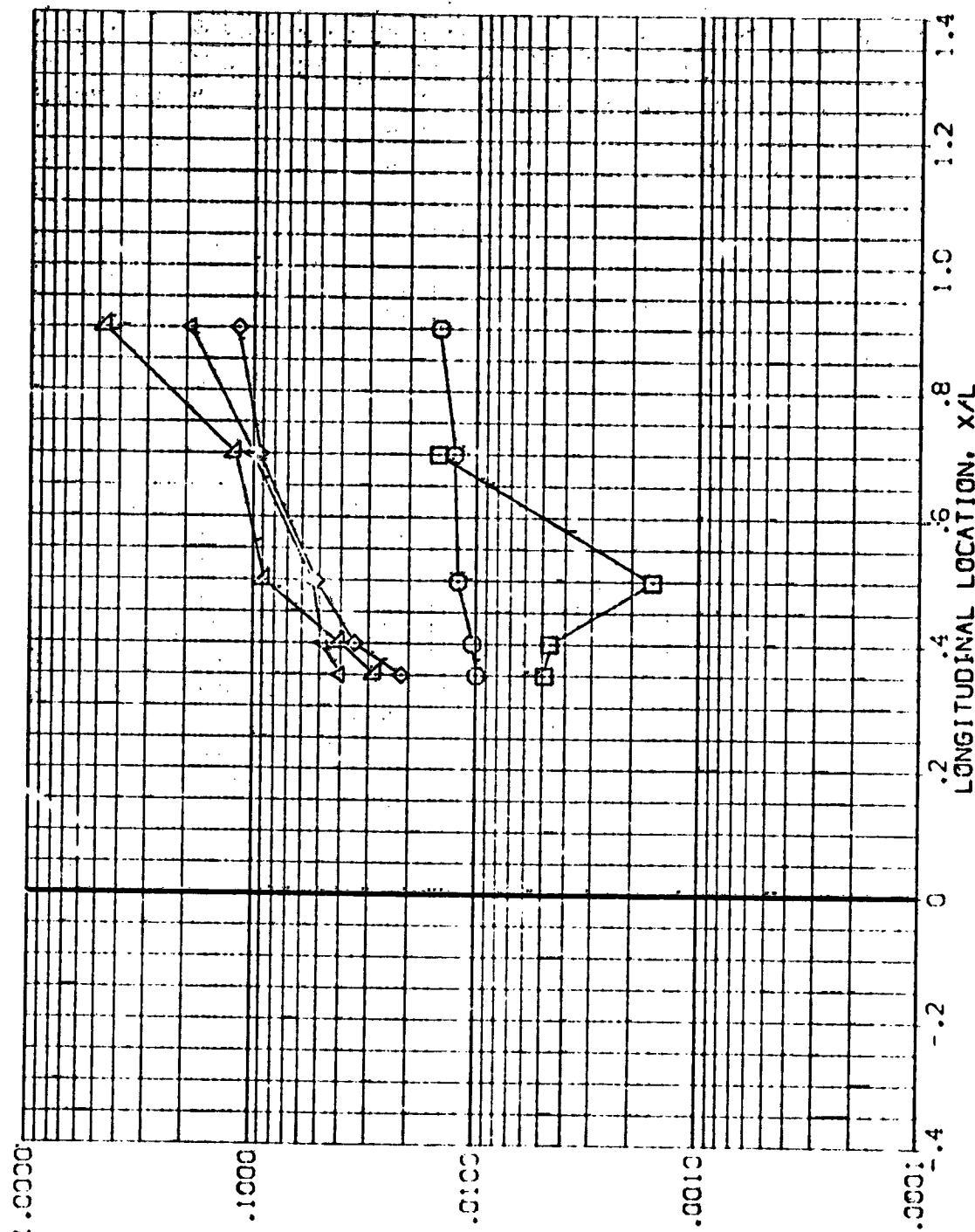


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

VAC = 5.300 HAW/HREF = 0.900 BP = 117.000

ALPHA	BETA	P-VL
.000	.000	1.000
-.000	.000	1.000
-.000	.000	1.000
-.000	.000	1.000
-.170	.000	1.000

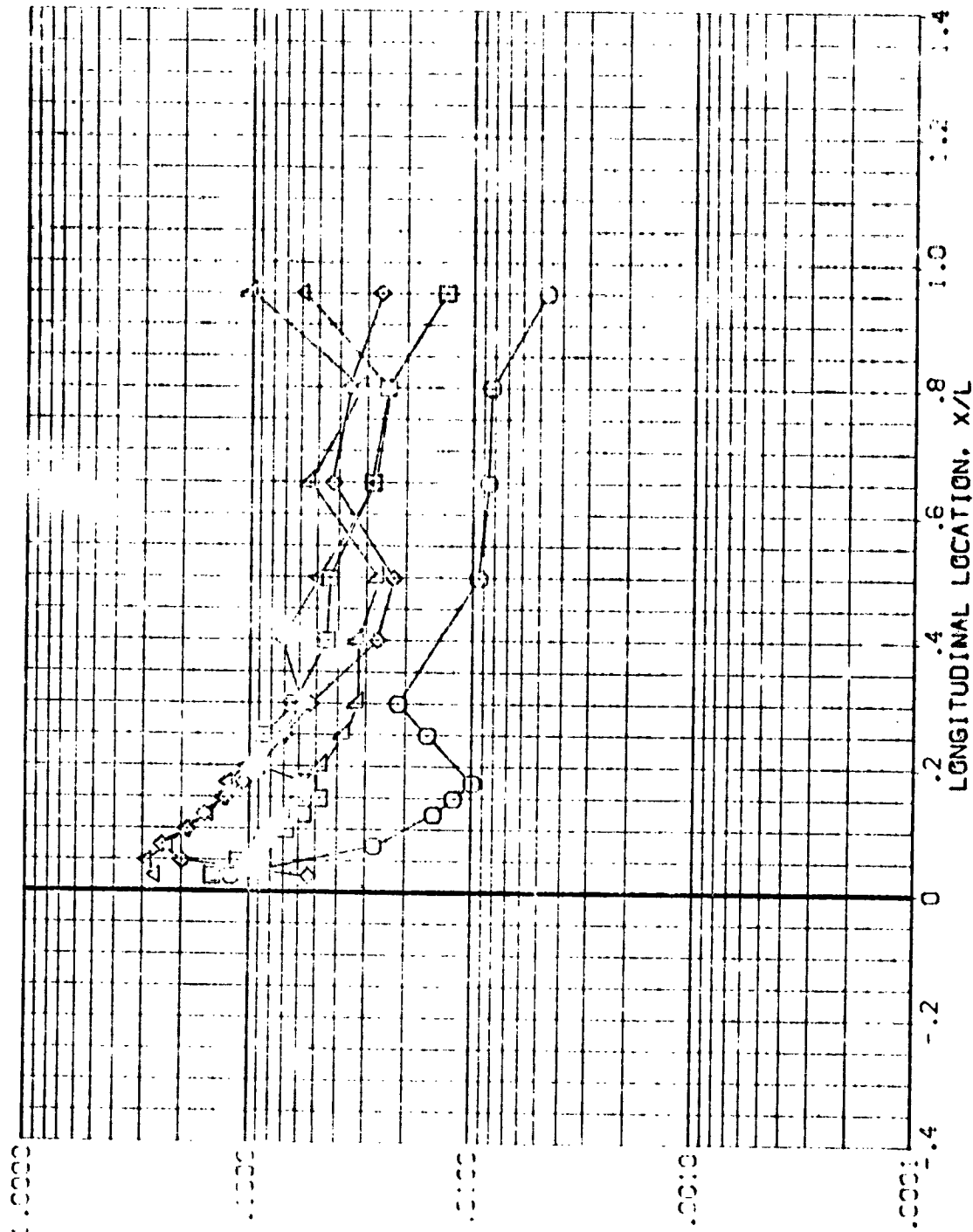


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

WAGE = 5.300 HAW/HT = .900 BP = .000

UNITED STATES DEPARTMENT OF JUSTICE  
FEDERAL BUREAU OF INVESTIGATION

[illegible]

ALPHA	BETA	R <sup>2</sup> /L
.000	.000	1.000
-.30.000	.000	1.000
-.60.000	.000	1.000
-.90.000	.000	1.000
-.120.000	.000	1.000

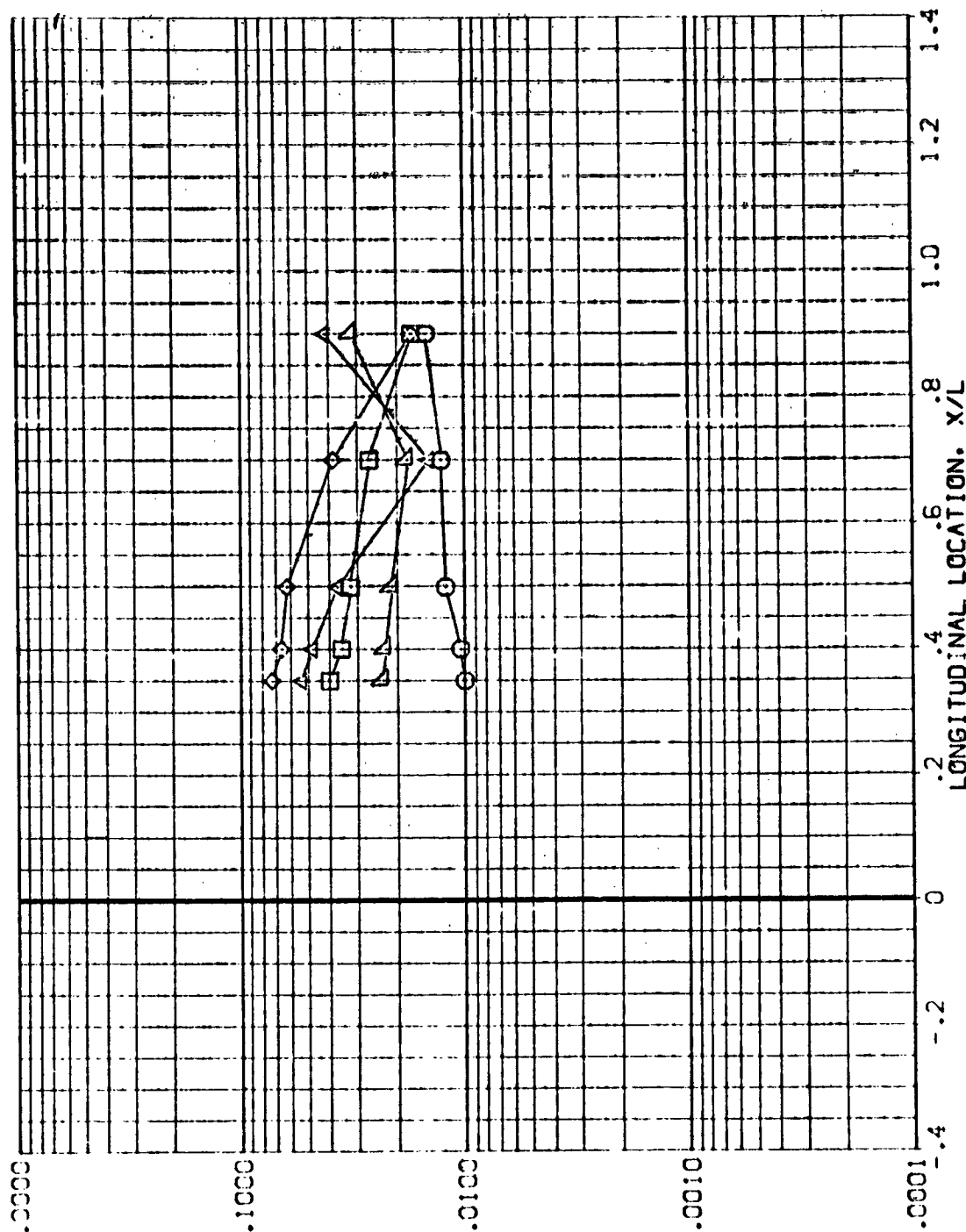


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

$$5.300 \times 10^4 = 53.000$$

DATA SET NUMBER  
(000000)  
(000000)  
(000000)  
(000000)  
(000000)

CONFIGURATION DESCRIPTION  
AVES 3.5-1.95 1.00 CI+1 UNDERSIDE FUSELAGE  
AVES 3.5-1.95 1.00 CI+1 UNDERSIDE FUSELAGE  
AVES 3.5-1.95 1.00 CI+1 UNDERSIDE FUSELAGE  
AVES 3.5-1.95 1.00 CI+1 UNDERSIDE FUSELAGE

ALPHA BETA PW/L  
30.000 0.000 1.000  
30.000 0.000 4.000  
60.000 0.000 1.000  
60.000 0.000 4.000

RATIO OF 10 W IN NEED NOT BEAT TRANSFER COEFFICIENTS, H/REF

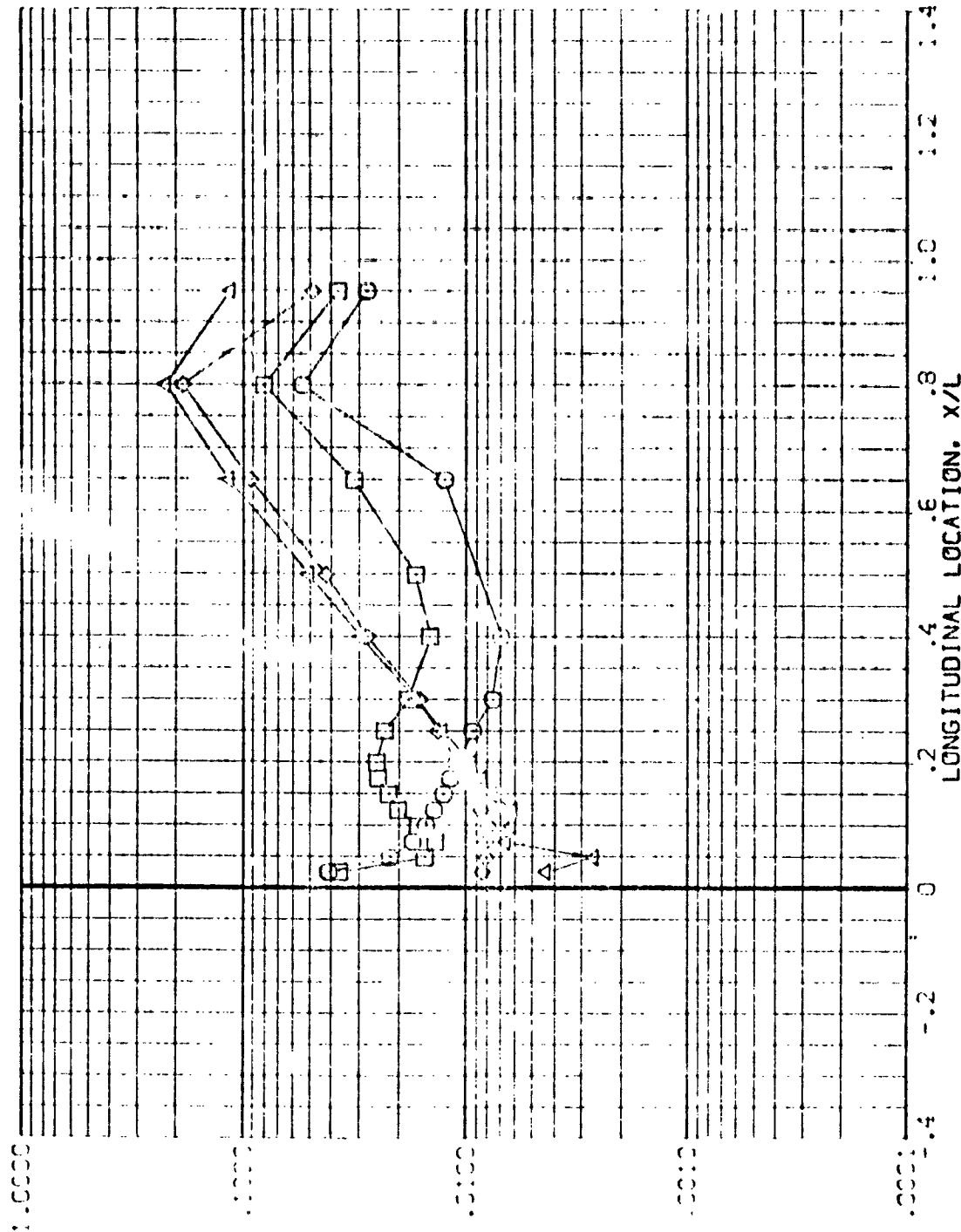


FIG. 9 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

MACH = 5.300  $-A^*/HT = .900$  BP = .000 PAGE 424

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (REVAC2) AMES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE  
 (REVAC3) AMES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE  
 (REVAC3) AMES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE  
 (REVAC3) AMES 3.5-195 IH28 Q1+T1 UNDERSIDE FUSELAGE

ALPHA BETA RV/L  
 80.000 .000 .1000  
 50.000 .000 .4000  
 50.000 .000 .1000  
 50.000 .000 .4000

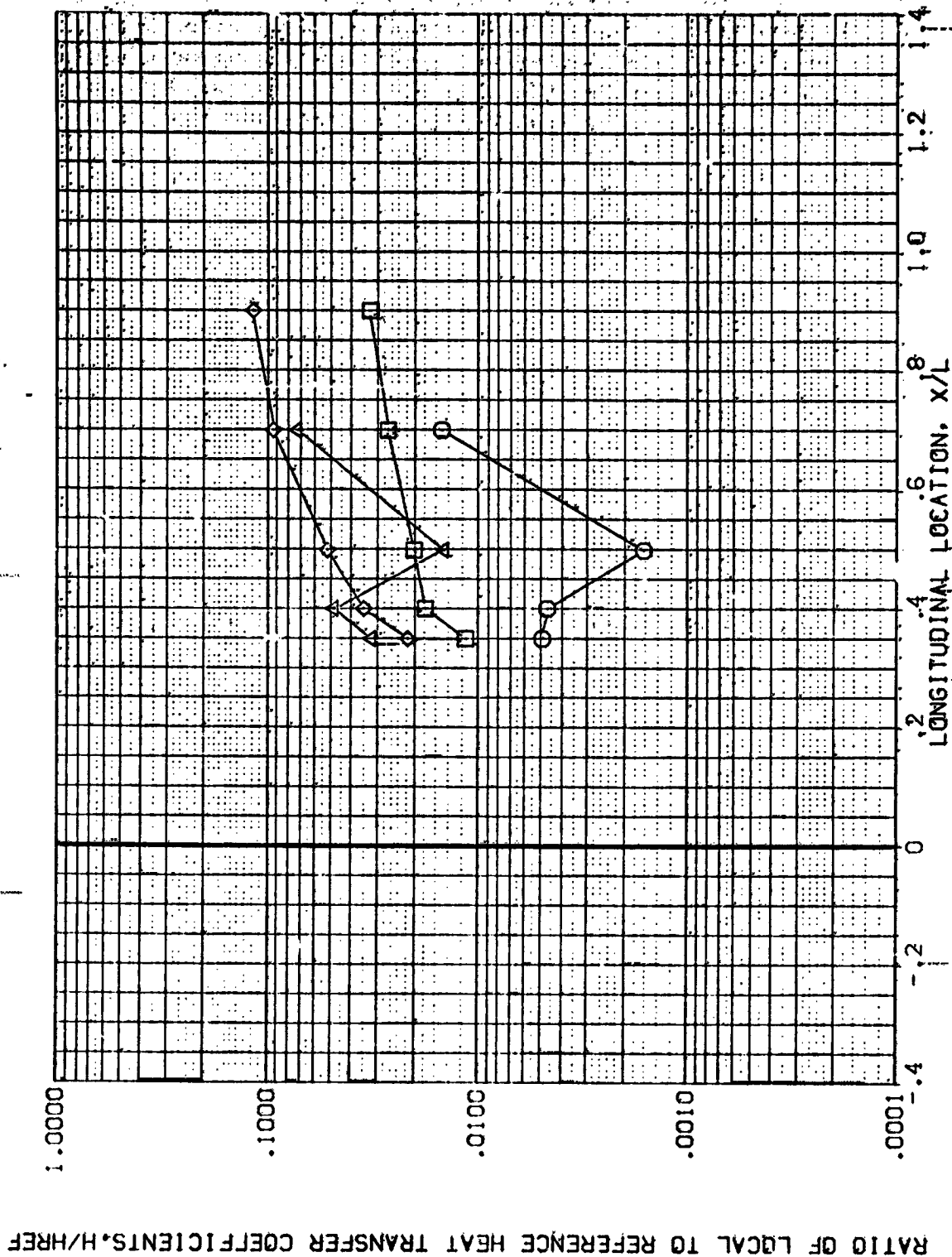


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 BP = 117,000

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (REVA02) AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE  
 (REVA12) AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE

ALPHA BETA RV/L  
 30.000 -5.000 1.000  
 30.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

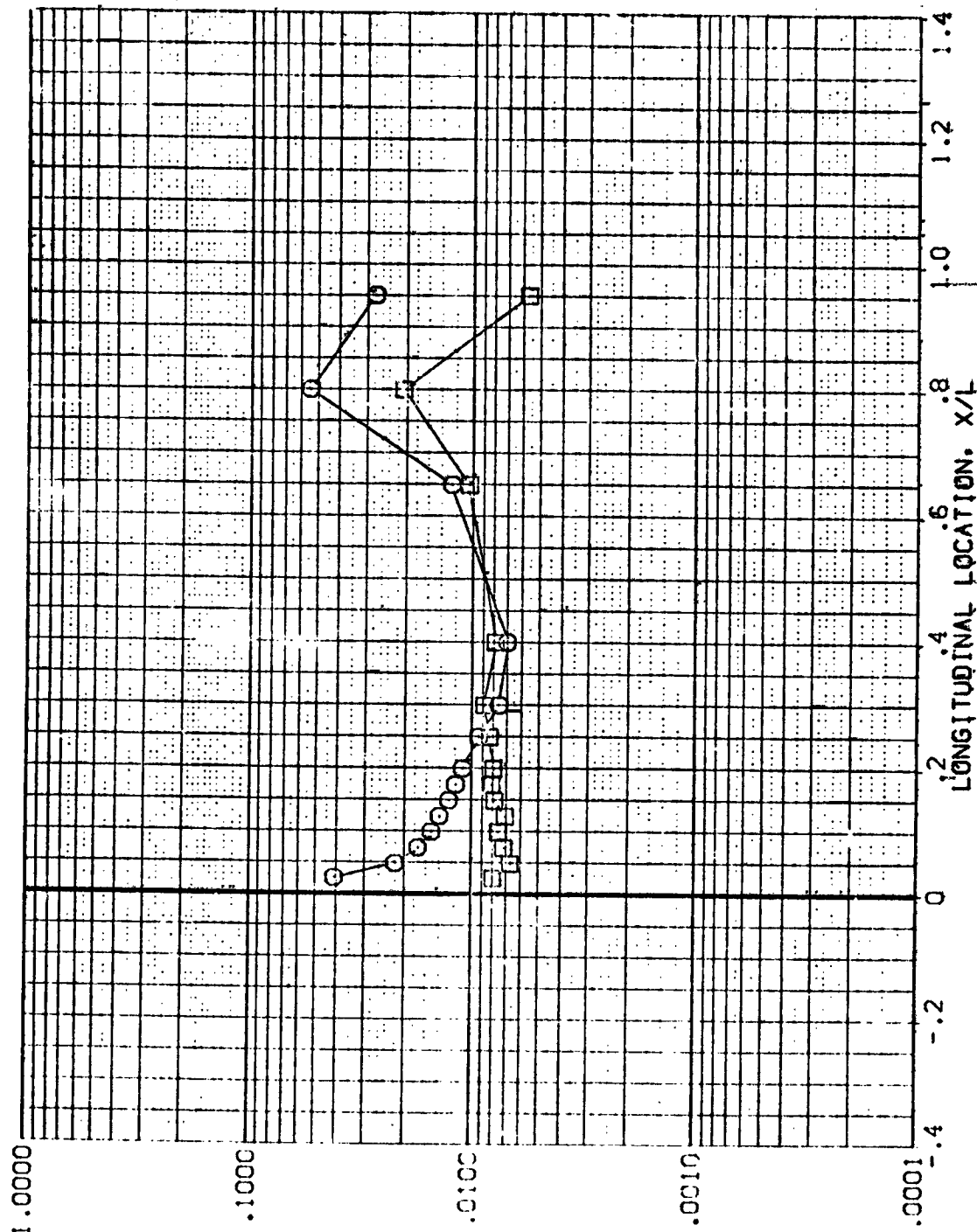


FIG. 8 ORBITER UNDERSIDE FUSELAGE. ORBITER IN THE PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 BP = .000

DATA SET SYMBOL:  $\square$  CONFIGURATION DESCRIPTION:  
 ANES 3 5-195 1428 C1171 UNDERSIDE FUSELAGE  
 ANES 3 5-195 1428 C1171 UNDERSIDE FUSELAGE

ALPHA BETA RNAL  
 30.000 0.000 1.000  
 30.000 5.000 1.000

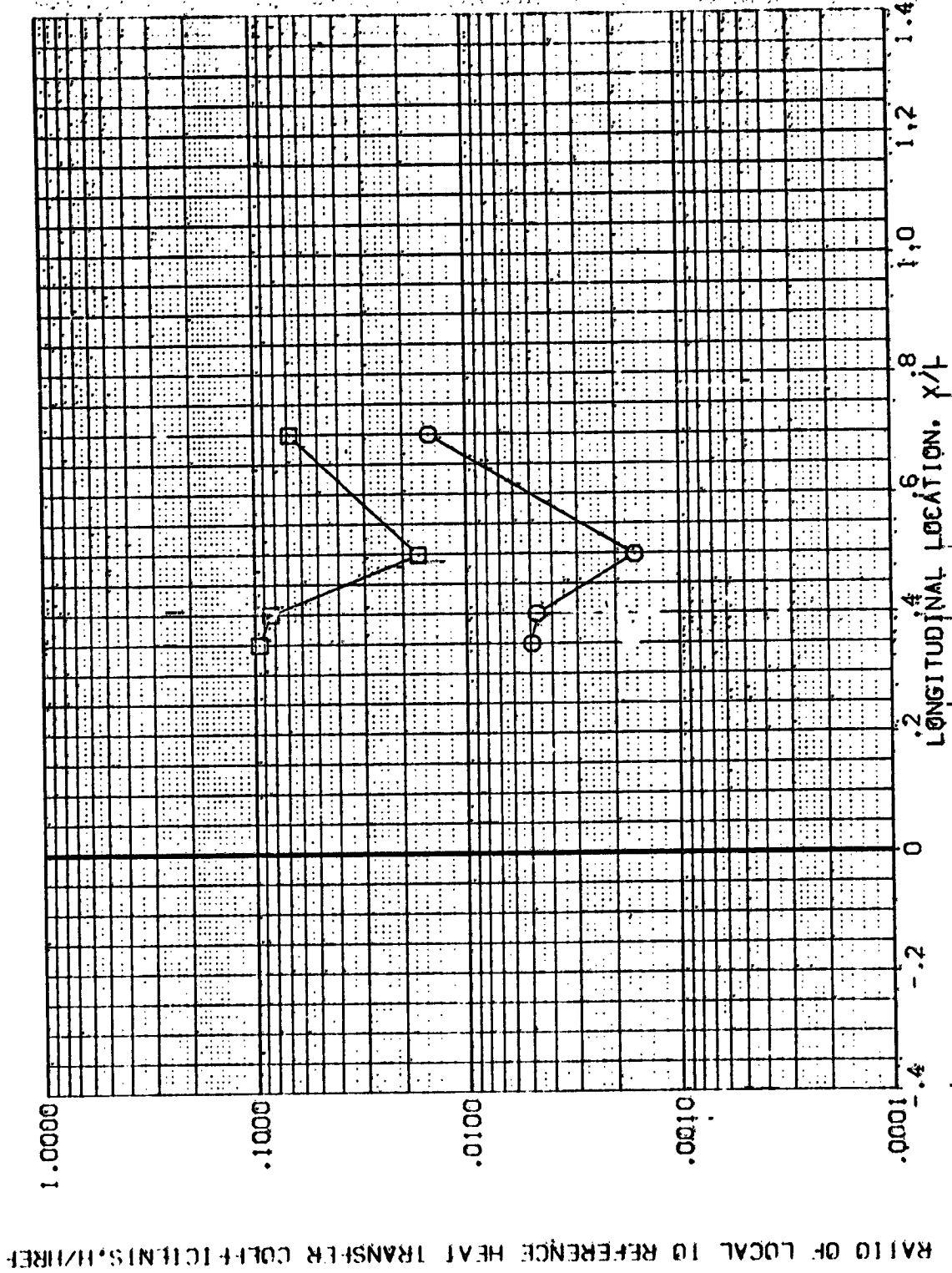


FIG. 8 ORBITER UNDERSIDE FUSELAGE, ORBITER IN THE PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 BP = 117,000



# AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE

(BEVA01)

SYMBOL BP .000  
1:7.000

MAW/HT .900  
MACH 5.228

PARAMETRIC VALUES  
ALPHA .000  
BETA .000  
RN/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

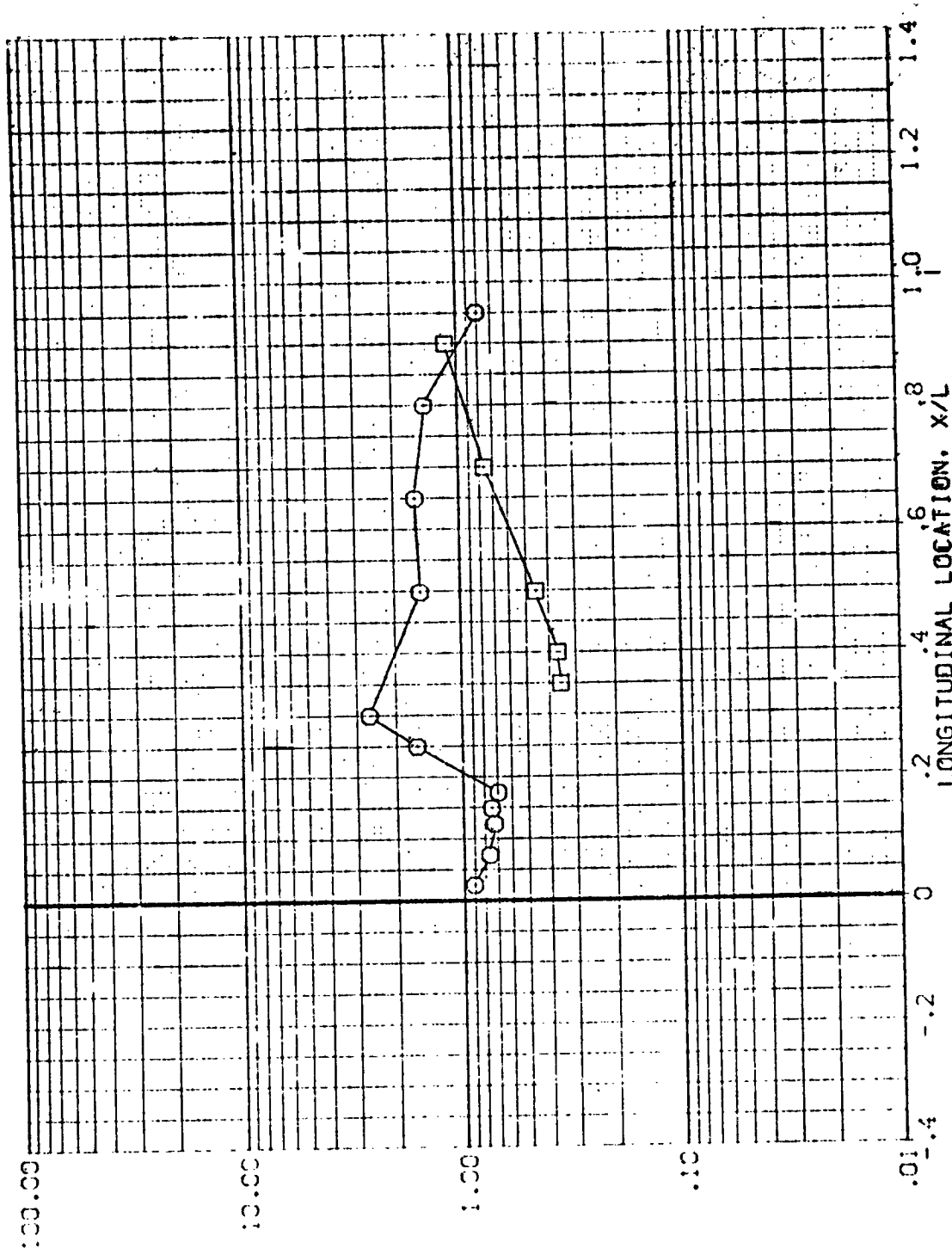


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-:95 IH28 01+T1 UNDERSIDE FUSELAGE (BEVAQ2)

SW3CL BP  
□ 117.000

HAZ/HT VACH  
.900 5.219

PARAMETRIC VALUES  
30 .000 BETA  
1.000 .090

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

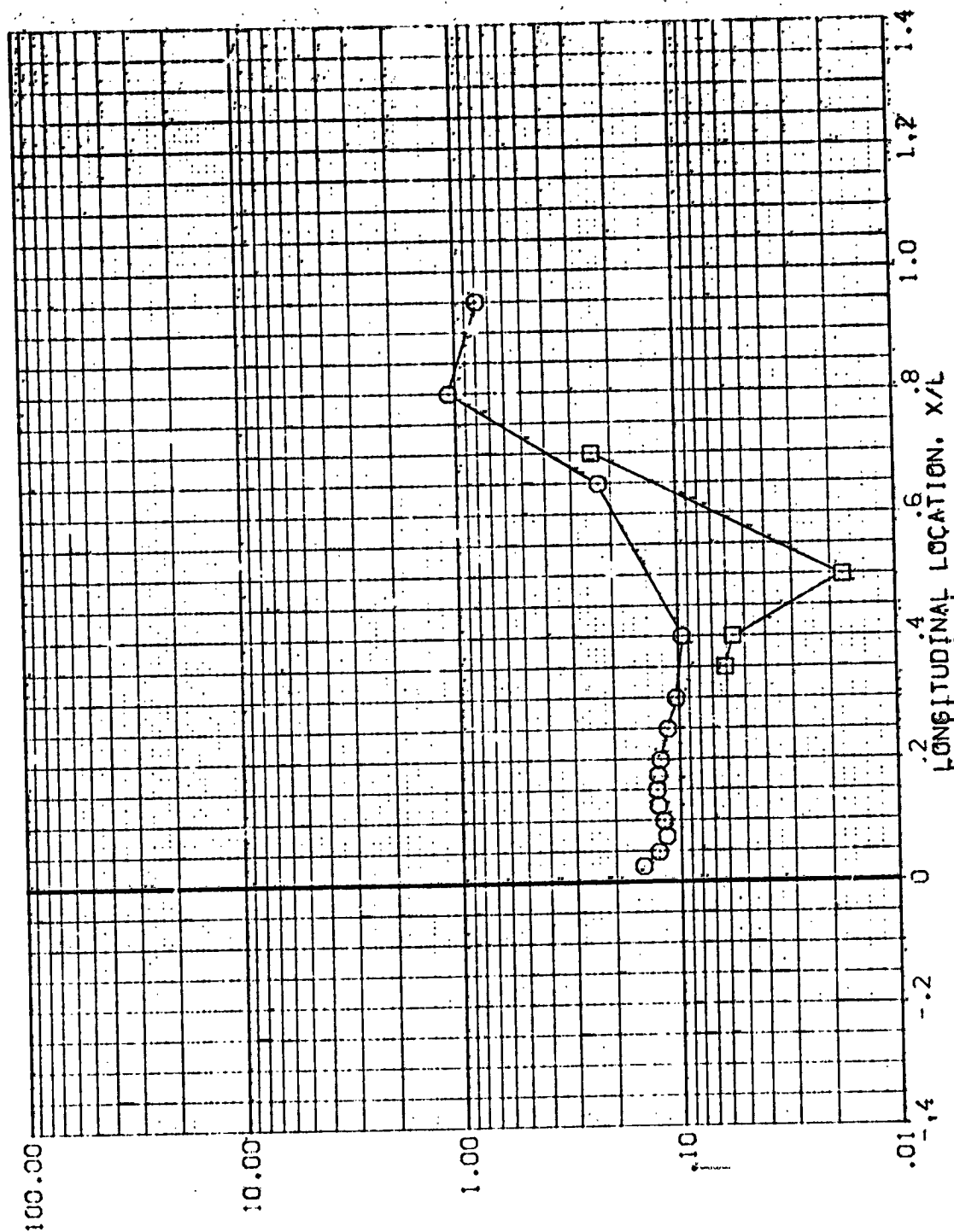


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

SVVSC	SP	WACH	WACH	PARAMETRIC VALUES
□	.000	.900	5.220	ALPHA
○	117.000			RN/L
				BETA
				.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

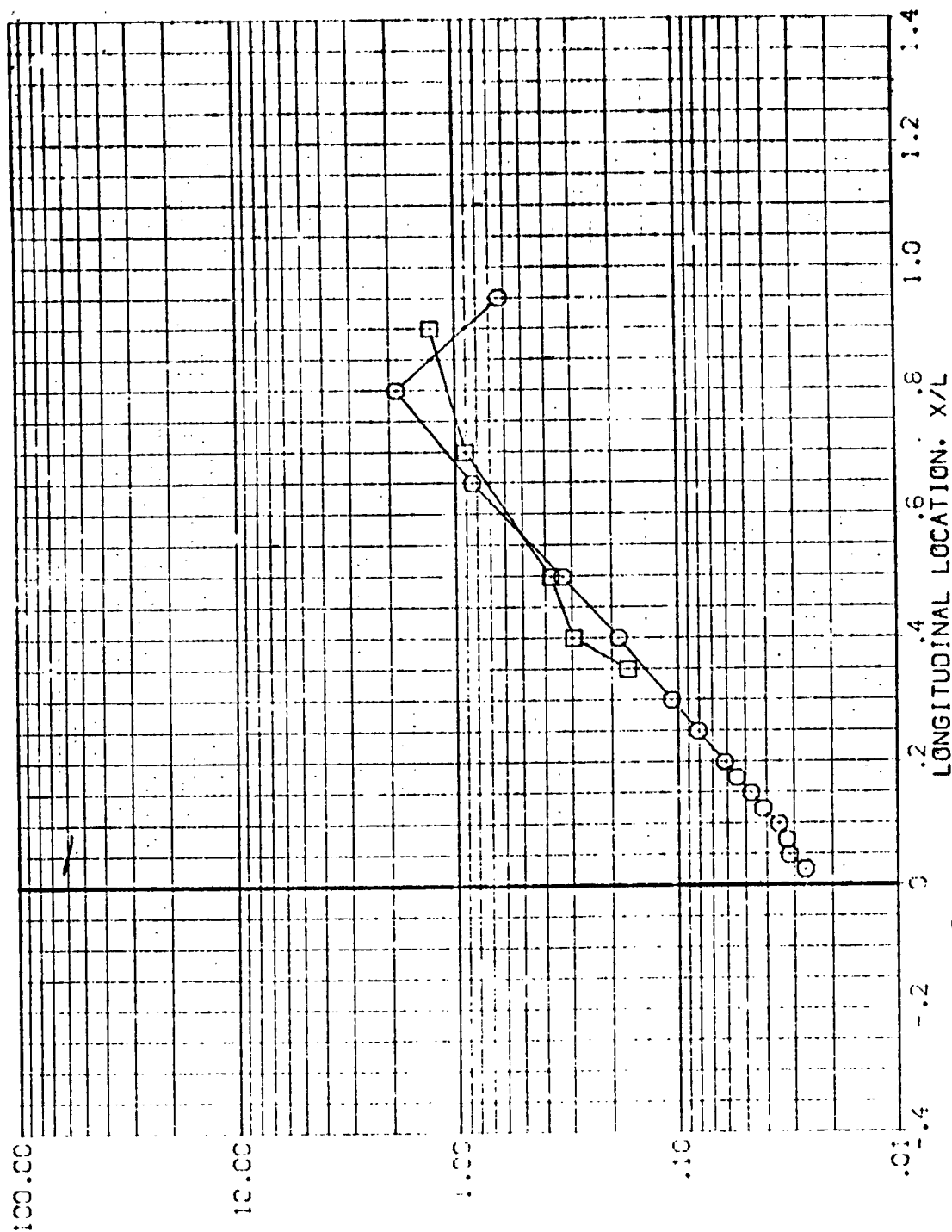


FIG. 9 ORBITER UNDERSIDE FUSELAGE RATIO OF INTERFERENCE TO UNDISTURBED

REPRODUCTION OF THIS  
MANUAL PAGE IS FOR

AVES 3.5-195 1H28 01-T1 UNDERSIDE FUSELAGE (BEVA04)

SP 117.000  
 1.000  
 1.900  
 5.289  
 MACH

PARAMETRIC VALUES  
 ALPHA 90.000  
 BETA 1.000  
 RN/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

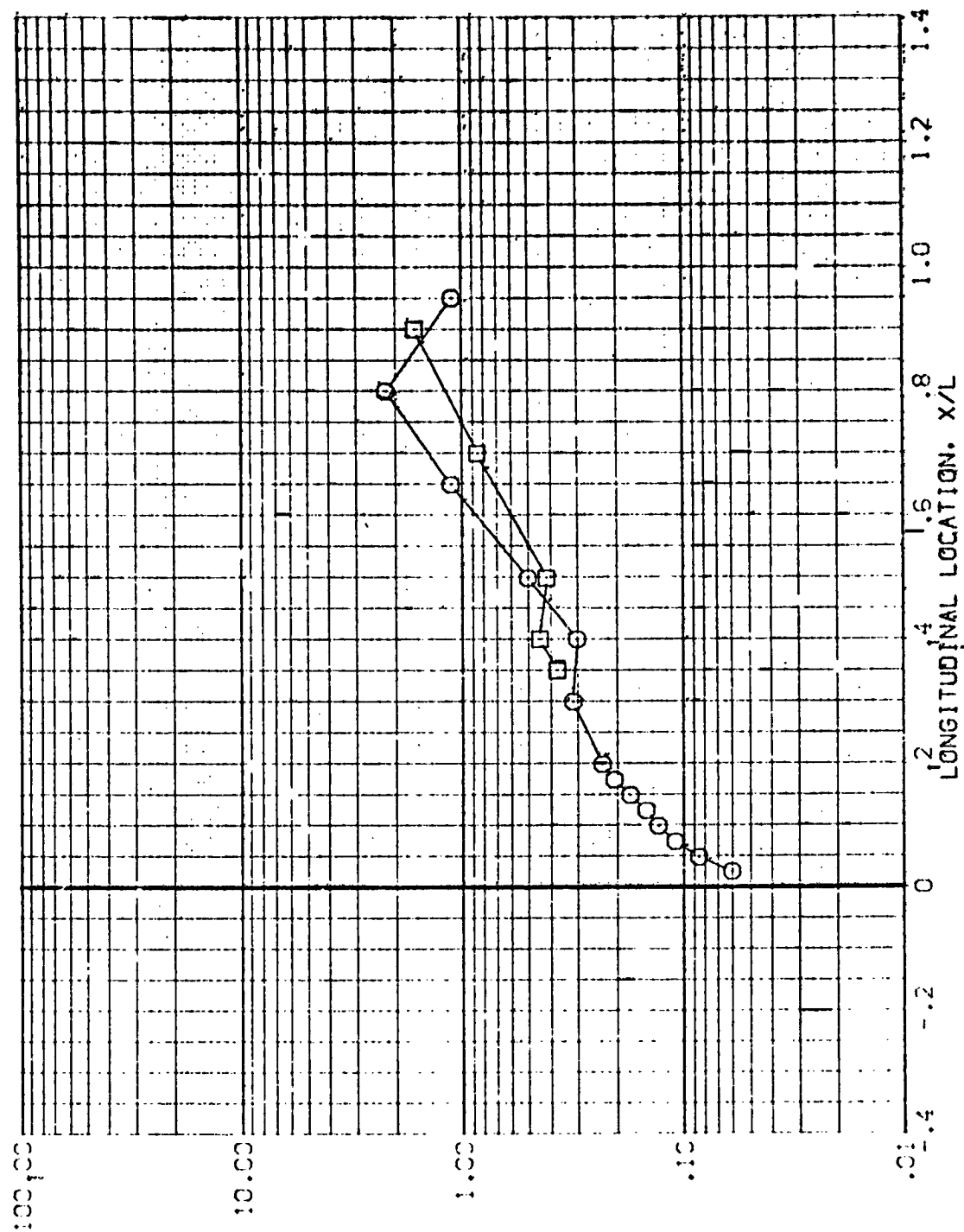


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

# AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (BEVA05)

SYNCL BP .003 117.000  
 WAVE/WT .900 MACH 5.220

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 RN/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

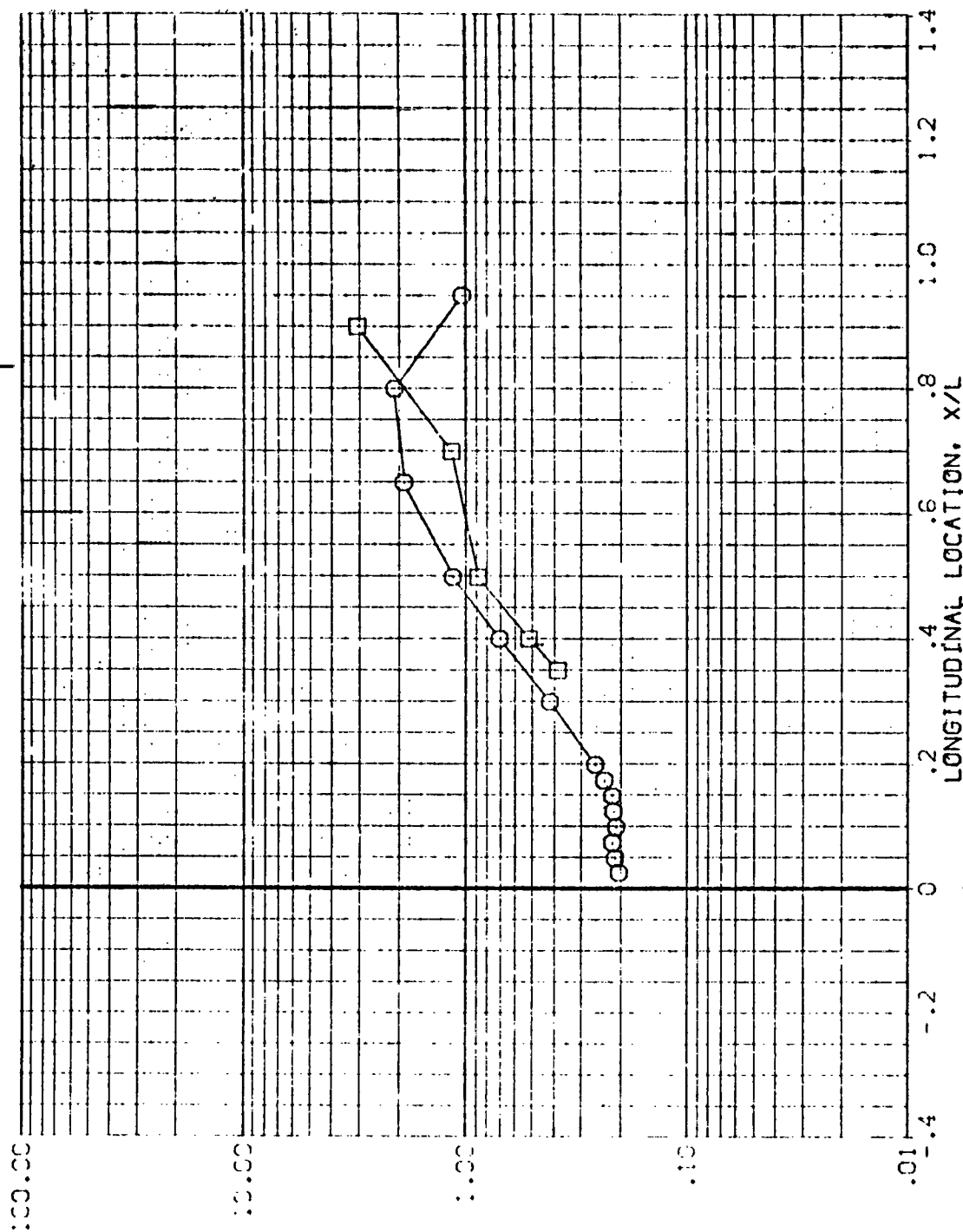


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (BEVA06)

SP .000 MACH .900  
 :17.000  
 PARAMETRIC VALUES  
 ALP-A -120.000 BETA .000  
 AN/L 1.000

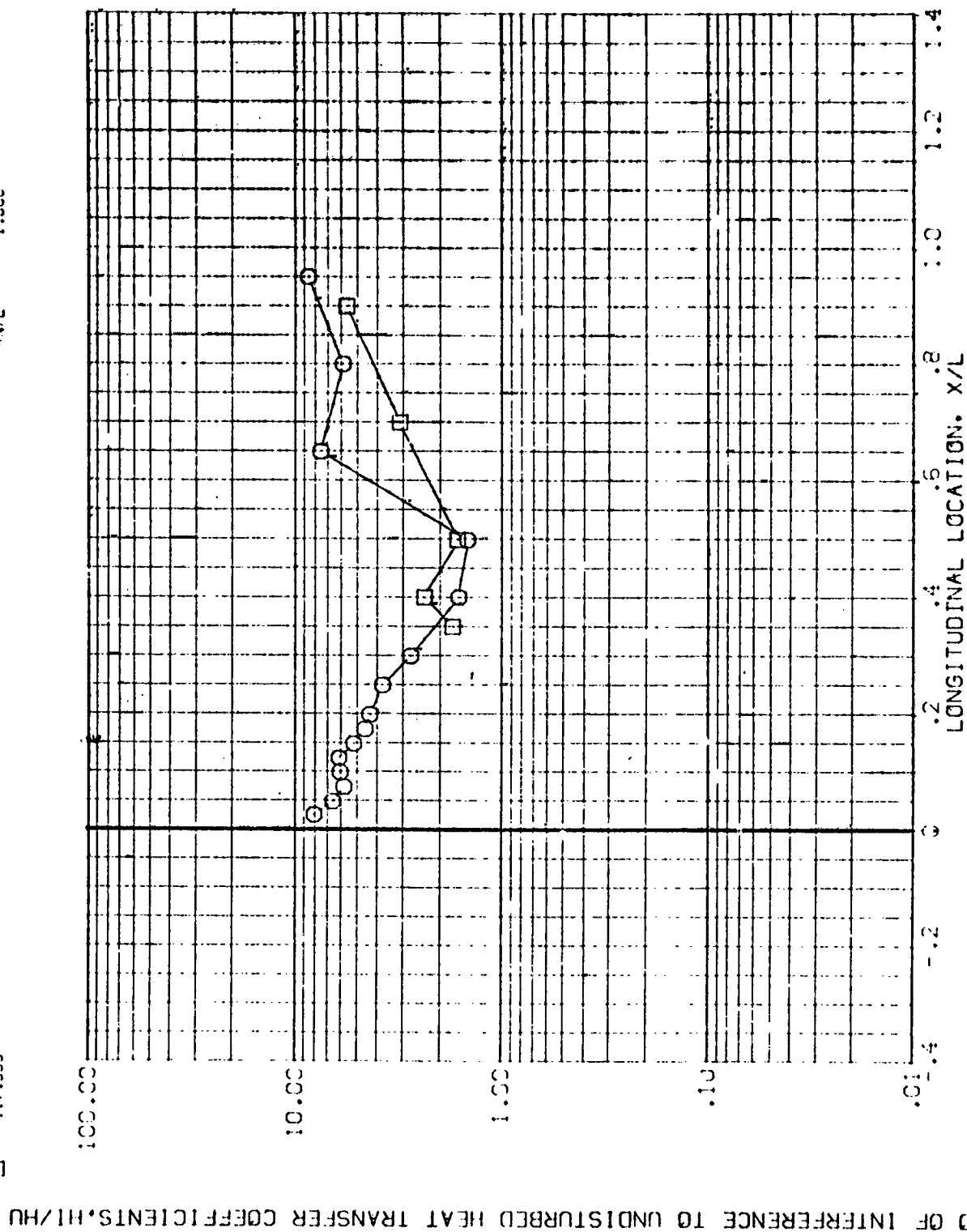


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

# AMES 3.5-195 IH28 01+T1 UNDERSIDE FUSELAGE (BEVAC7)

SYMBOL BP HAWA/T MACH  
 117.000 .000 .900 5.219

PARAMETRIC VALUES  
 ALPHA -50.000  
 RH/L 1.000  
 BETA 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H_i/H_u$

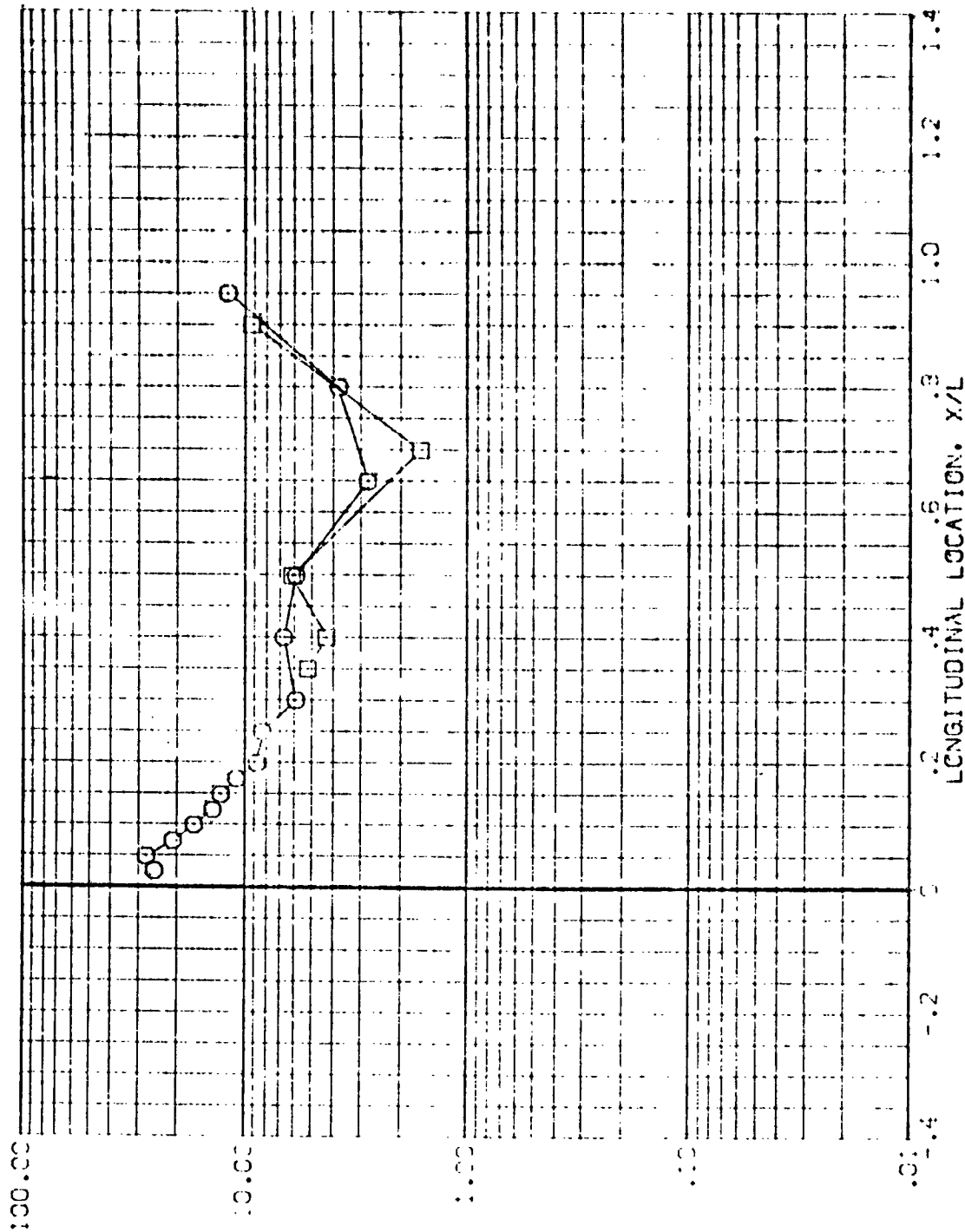


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 1428 01+T1 UNDERSIDE FUSELAGE

(BEVAC8)

PARAMETRIC VALUES  
 ALPHA -60.000  
 R/V/L 1.000  
 BE\*<sup>a</sup> .000

SP .000  
 WACH 5.120  
 .900  
 117.000

100

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

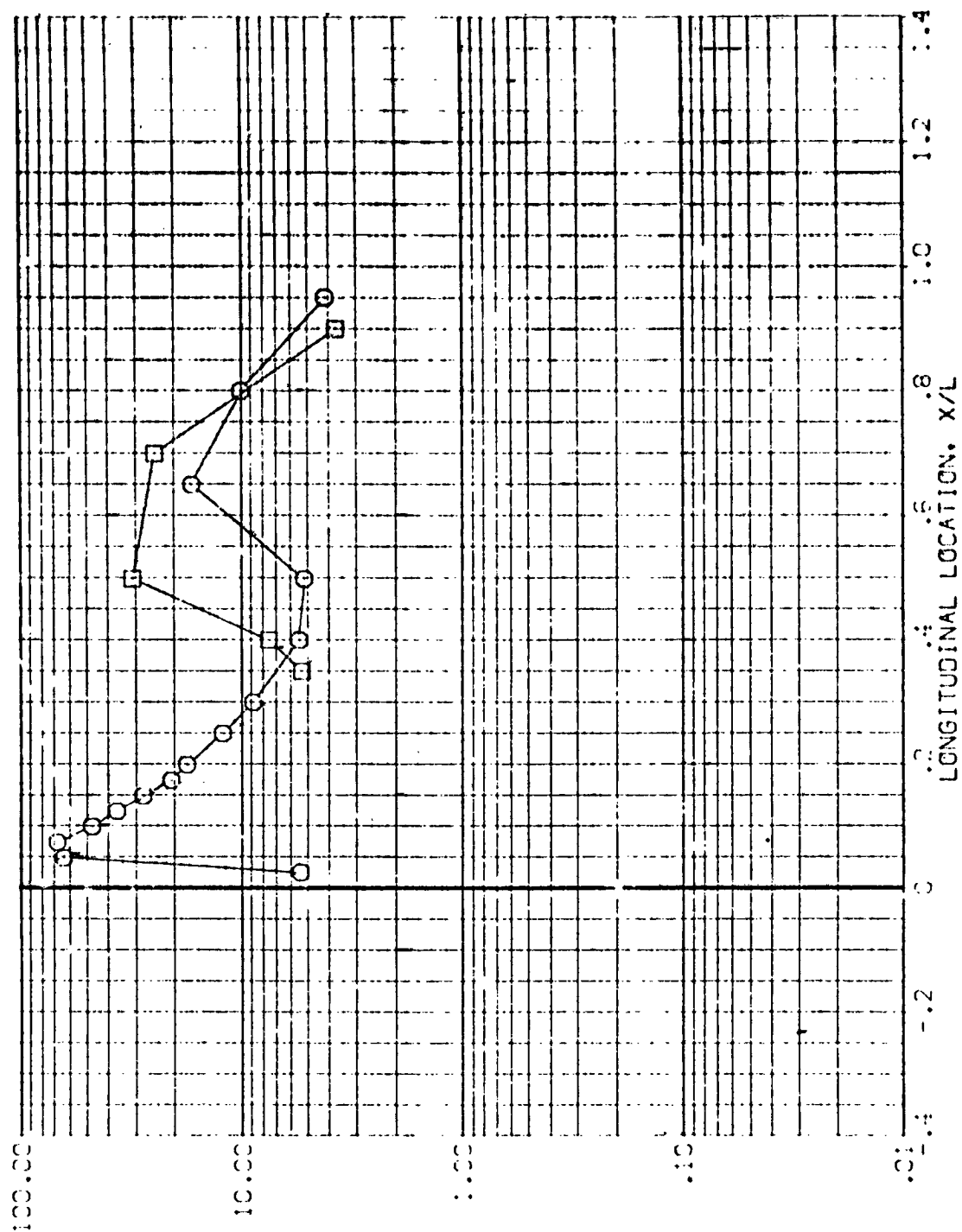


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED



AXES 3.5-195 IH28 01+TI UNDERSIDE FUSELAGE

(BEVAOL)

S-1932-  
 BP  
 .000  
 117.000  
 MACH  
 900  
 5.220

PARAMETER VALUES  
 ALPHA  
 -20.000  
 BETA  
 .000  
 RV/L  
 .000

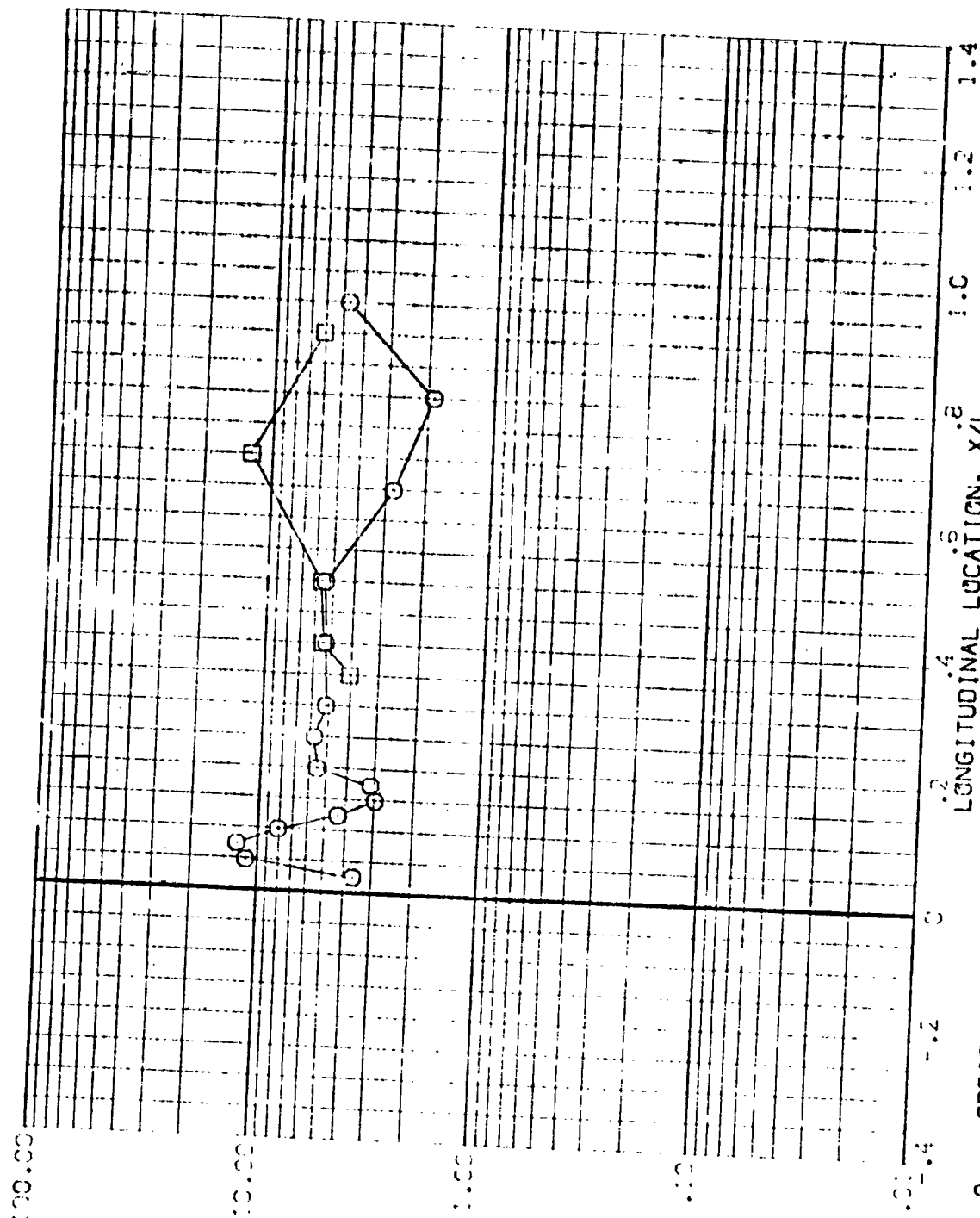
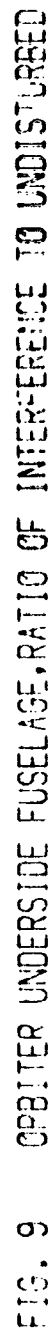


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED



RATIO OF INTERFERENCE TO UNDERSOURD THAT TRANSFER COEFFICIENTS, H/H<sub>0</sub>[illegible]

DATA SET SYMBOL

CONFIGURATION DESCRIPTION

AVES 3.5-195 IH28 01+11 UNDERSIDE FUSELAGE  
 AVES 3.5-195 IH28 01+11 UNDERSIDE FUSELAGE  
 AVES 3.5-195 IH28 01+11 UNDERSIDE FUSELAGE  
 AVES 3.5-195 IH28 01+11 UNDERSIDE FUSELAGE

ALPHA BETA RV/L  
 .000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

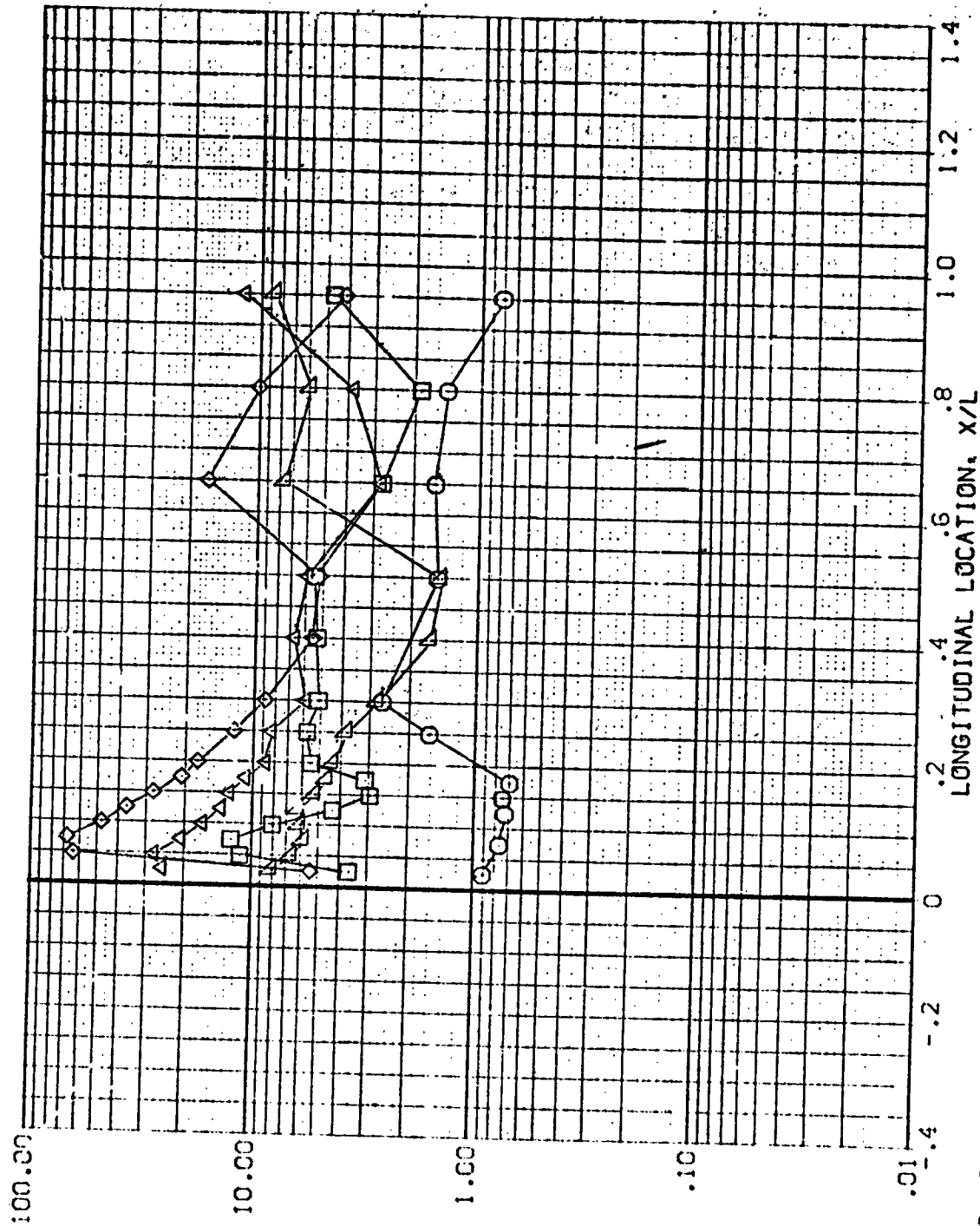


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

MACH = 5.300 HAW/HT = .900 BP = .000

DATA SET SYMBOL CONFIGURATION DESCRIPTION

DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(SEVA01)	AMES 3.5-195 (H28 01+11) UNDERSIDE FUSELAGE
(SEVA09)	AMES 3.5-195 (H28 01+11) UNDERSIDE FUSELAGE
(SEVA08)	AMES 3.5-195 (H28 01+11) UNDERSIDE FUSELAGE
(SEVA07)	AMES 3.5-195 (H28 01+11) UNDERSIDE FUSELAGE
(SEVA06)	AMES 3.5-195 (H28 01+11) UNDERSIDE FUSELAGE

ALPHA BETA PIVL

ALPHA	BETA	PIVL
.300	.000	1.000
-30.000	.000	1.000
-60.000	.000	1.000
-90.000	.000	1.000
-120.000	.000	1.000

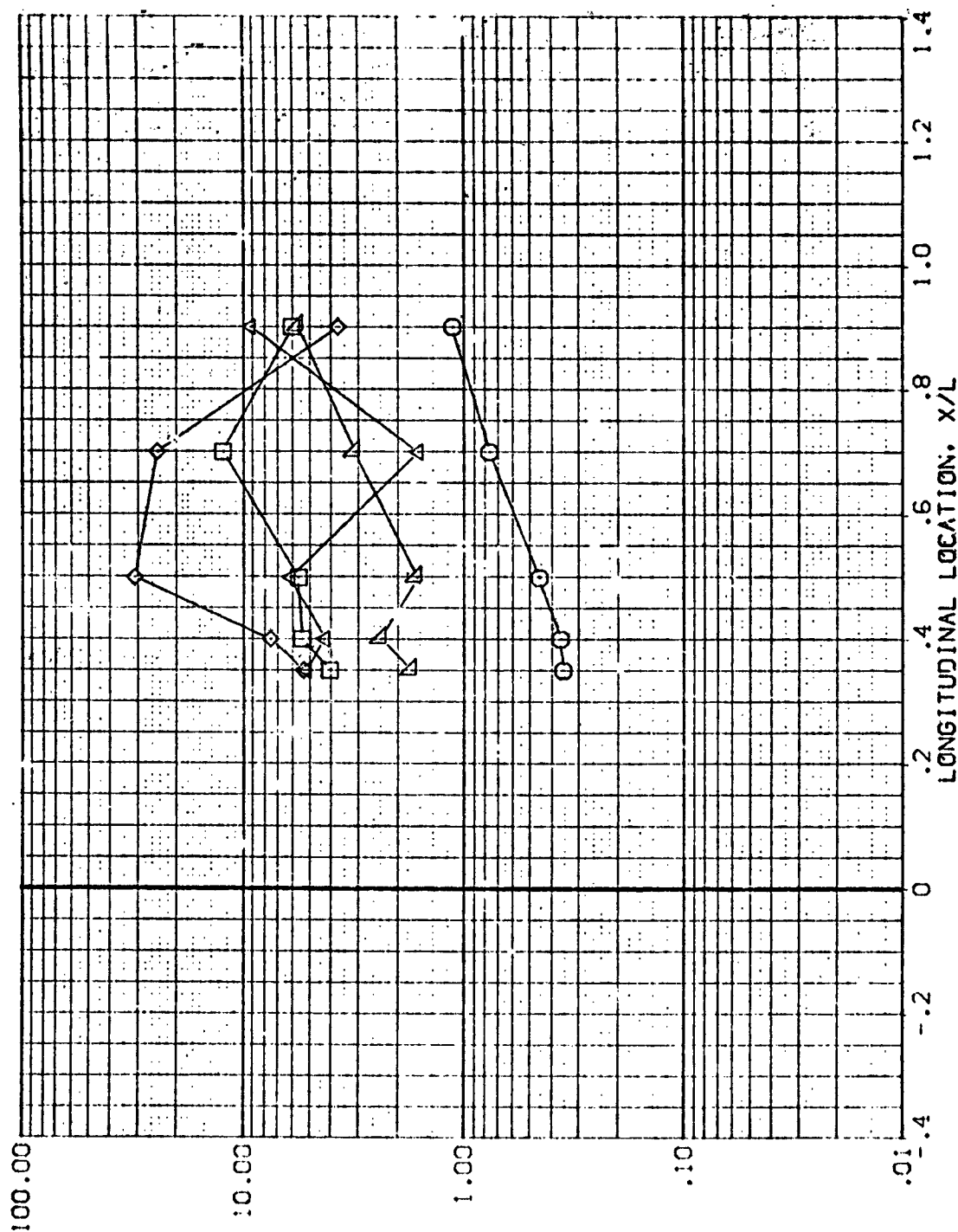


FIG. 9 ORBITER UNDERSIDE FUSELAGE, RATIO OF INTERFERENCE TO UNDISTURBED

MACH = 5.300 HAX/HT = .900 BP = 117.000

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB19)

SYMBOL HAW/HT Z MACH  
 ◊ .850 375.000 5.220  
 □ .900  
 ◊ 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 PHI/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

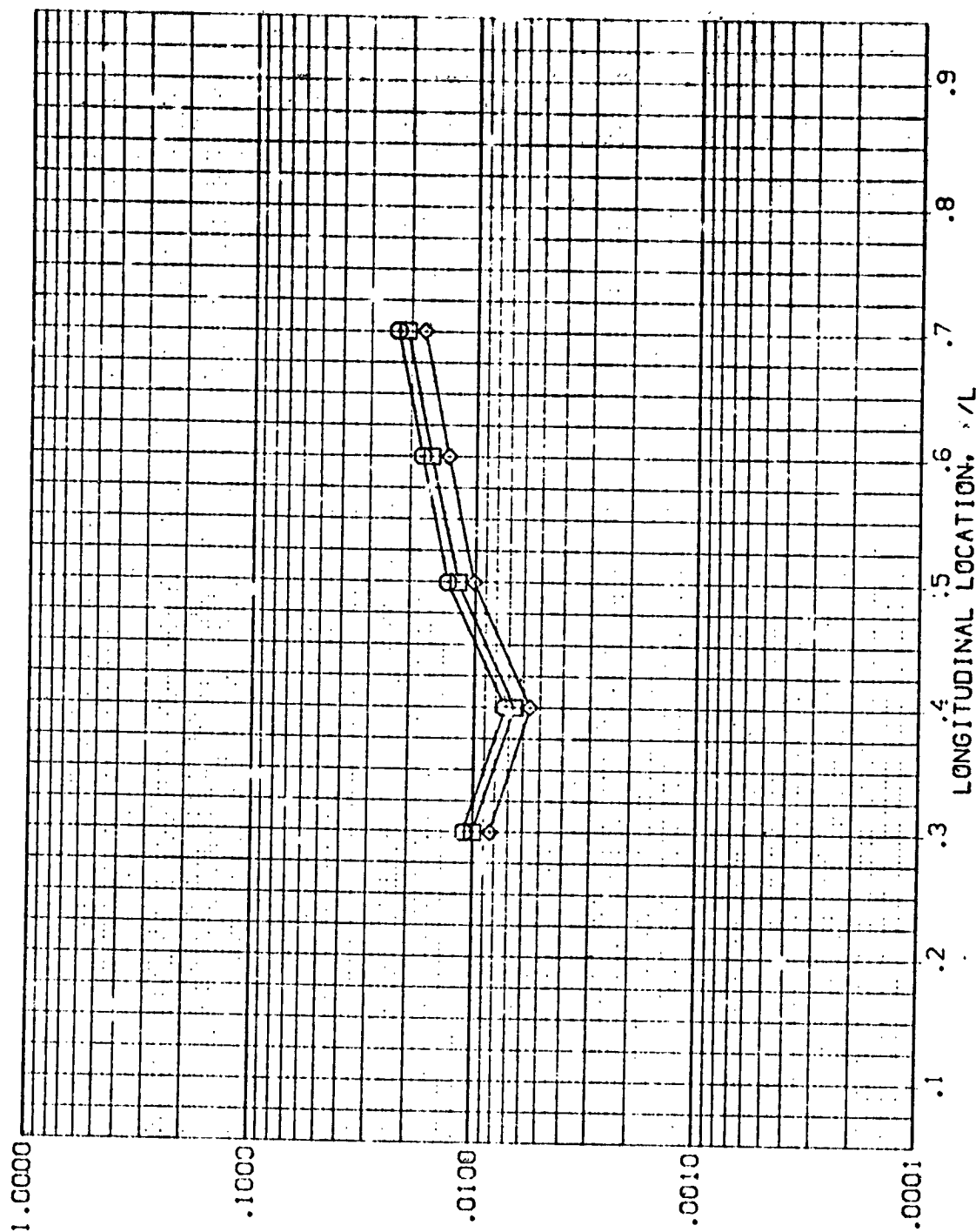


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB19)

AMES 3.5-195 IH28 01 BODY SIDEWALL

SYMBOL HAW/HT Z MACH

◇ .850 425.000 5.220  
□ .900  
◇ 1.000

PARAMETRIC VALUES  
300 BETA .000  
1.000

ALPHA  
RN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

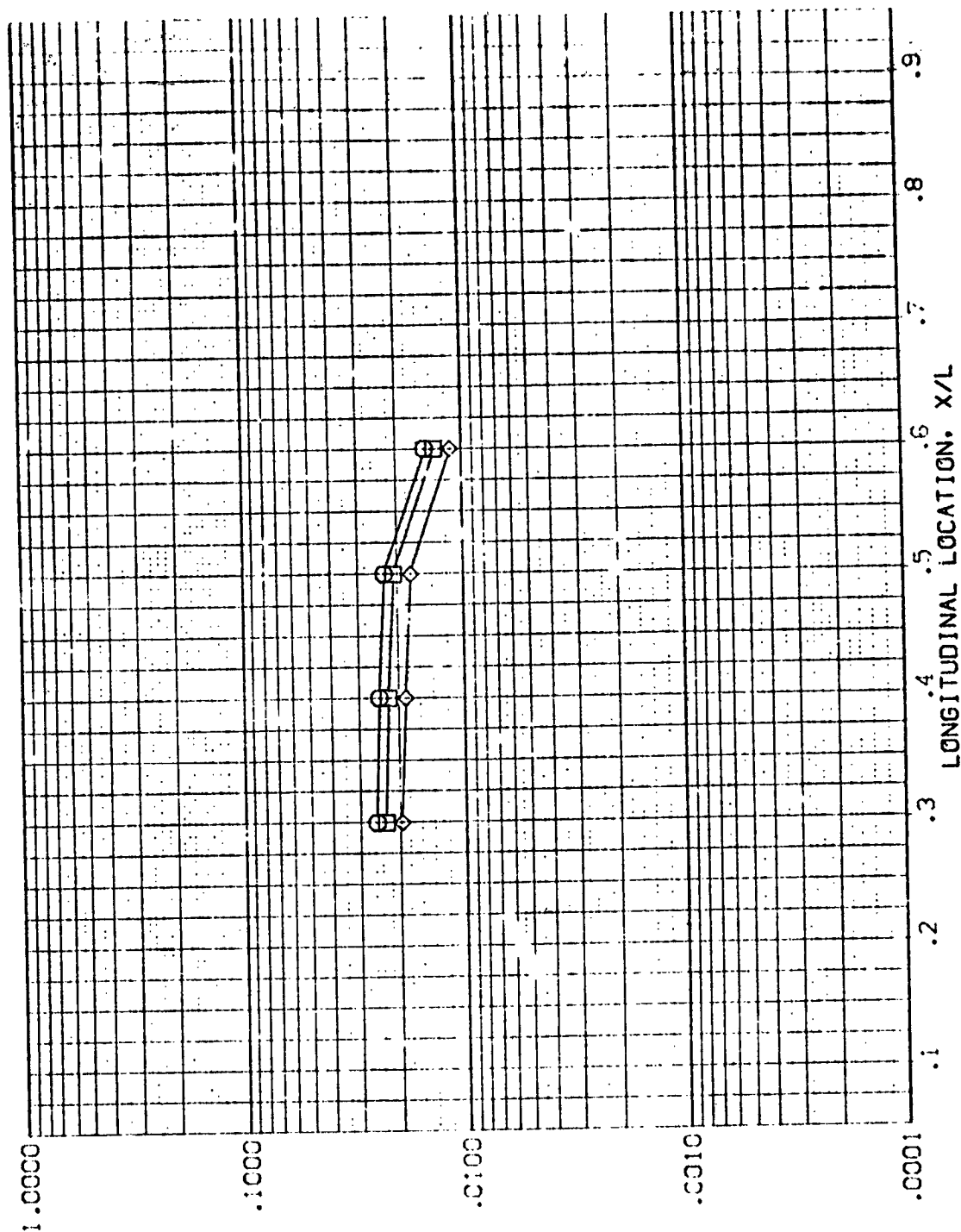


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

PROPERTY OF THE  
OFFICIAL PAGE IS FOR

AMES 3.5-195 IH28 01

BODY SIDEWALL

(REVB19)

SYMBOL HAW/HT Z MACH  
 .850 501.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 RV/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

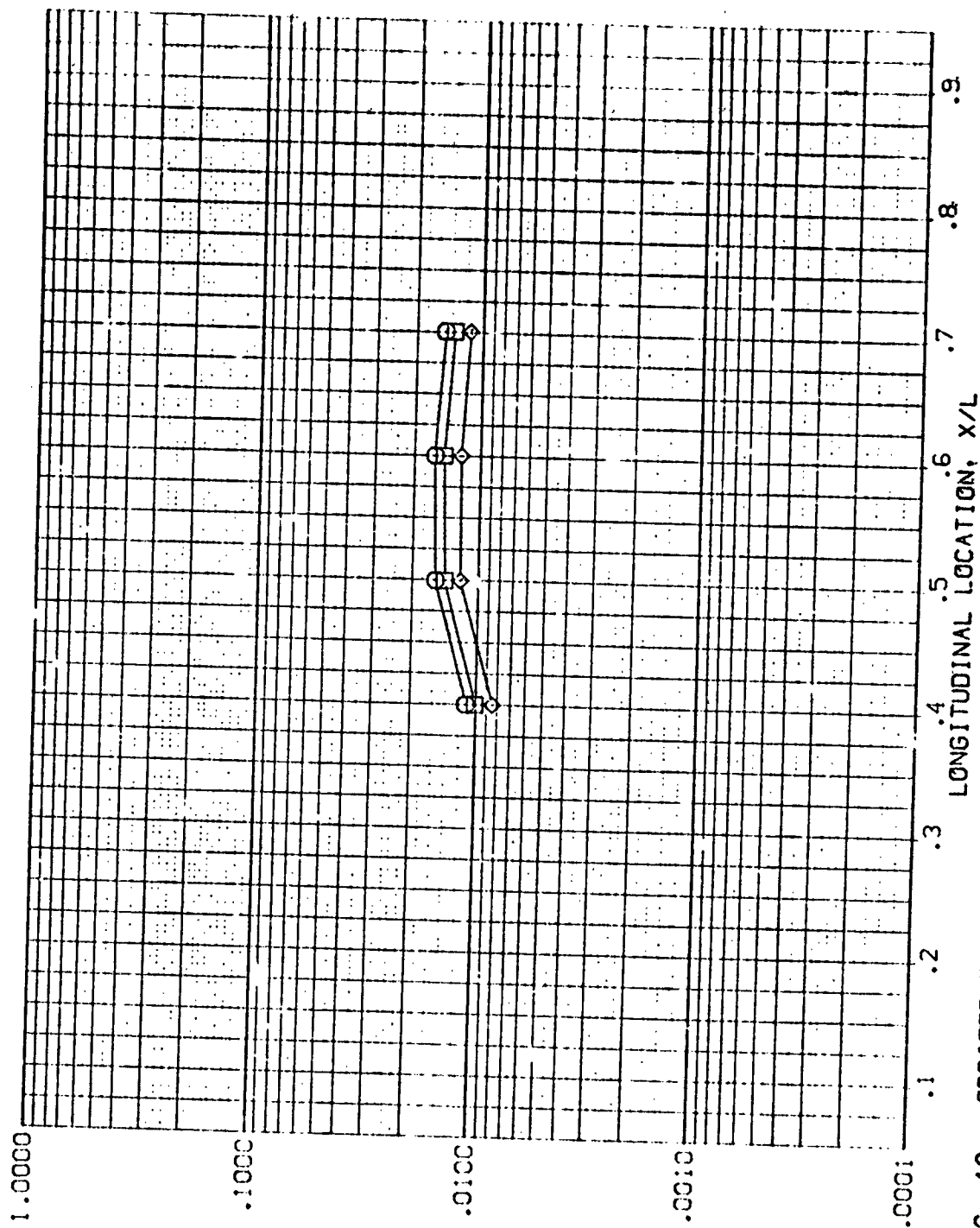


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AMES 3.5-135 1H28 01

MAW/HT	Z	MACH
.850	375.000	5.219
.900		
1.000		

PARAMETRIC VALUES	
ALPHA	30.000 BETA'
RN/L	1.000

The plot shows the ratio of the maximum to the minimum value of the function  $f$  as a function of the parameter  $\alpha$ . The y-axis is logarithmic, and the x-axis is linear. Two data series are plotted: one with open circles and one with open diamonds. Both series show a decreasing trend as  $\alpha$  increases.

$\alpha$	Ratio (Circles)	Ratio (Diamonds)
0.3	0.00045	0.00048
0.4	0.00035	0.00038
0.5	0.00025	0.00028
0.6	0.00018	0.00020
0.7	0.00015	0.00016

FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL.

(REVB20)

SYMBOL HAW/HT Z MACH  
 □ .850 425.000 5.219  
 ◇ .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 30.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

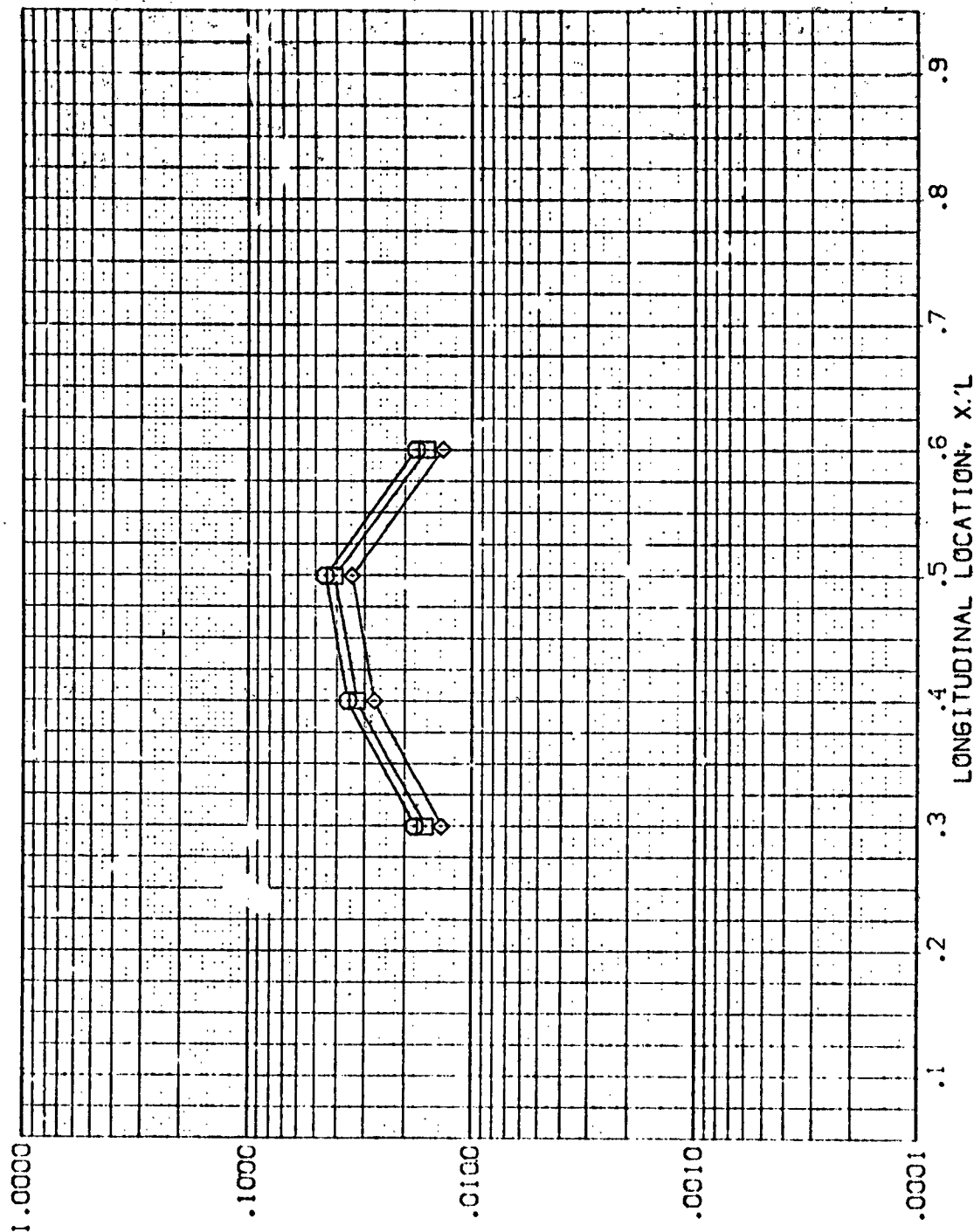


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB20)

BODY SIDEWALL

AMES 3.5-195 IH28 01

SYMBOL:  $\diamond$   $\square$   
HAZ/HT .850  
Z 501.000  
MACH 5.219  
1.000

PARAMETRIC VALUES  
ALPHA 30.000  
RN/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

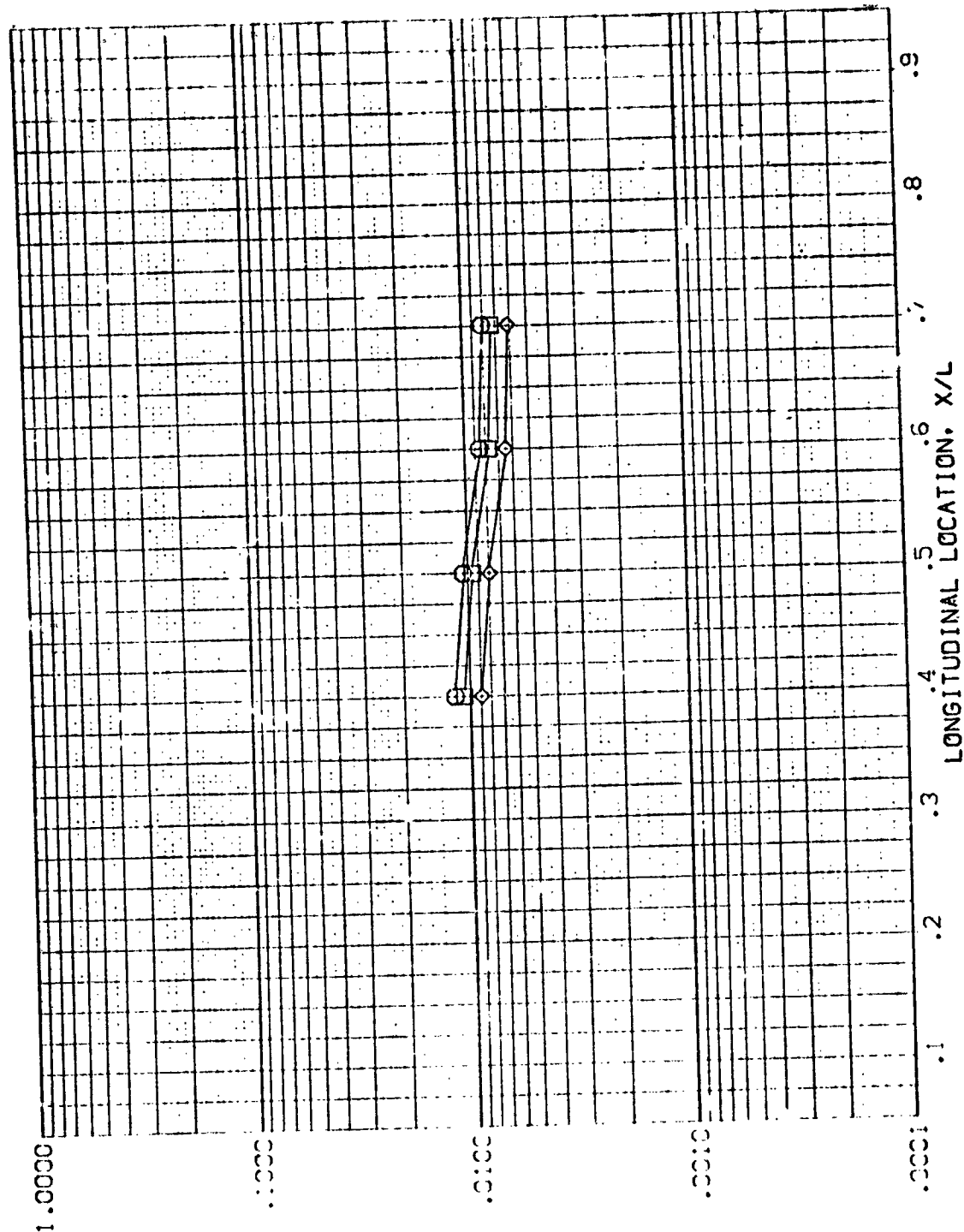


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REV821)

SYNOPSIS

HAUT-IT 2 MACH  
 .850 375.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 $\rho_0/L$  1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

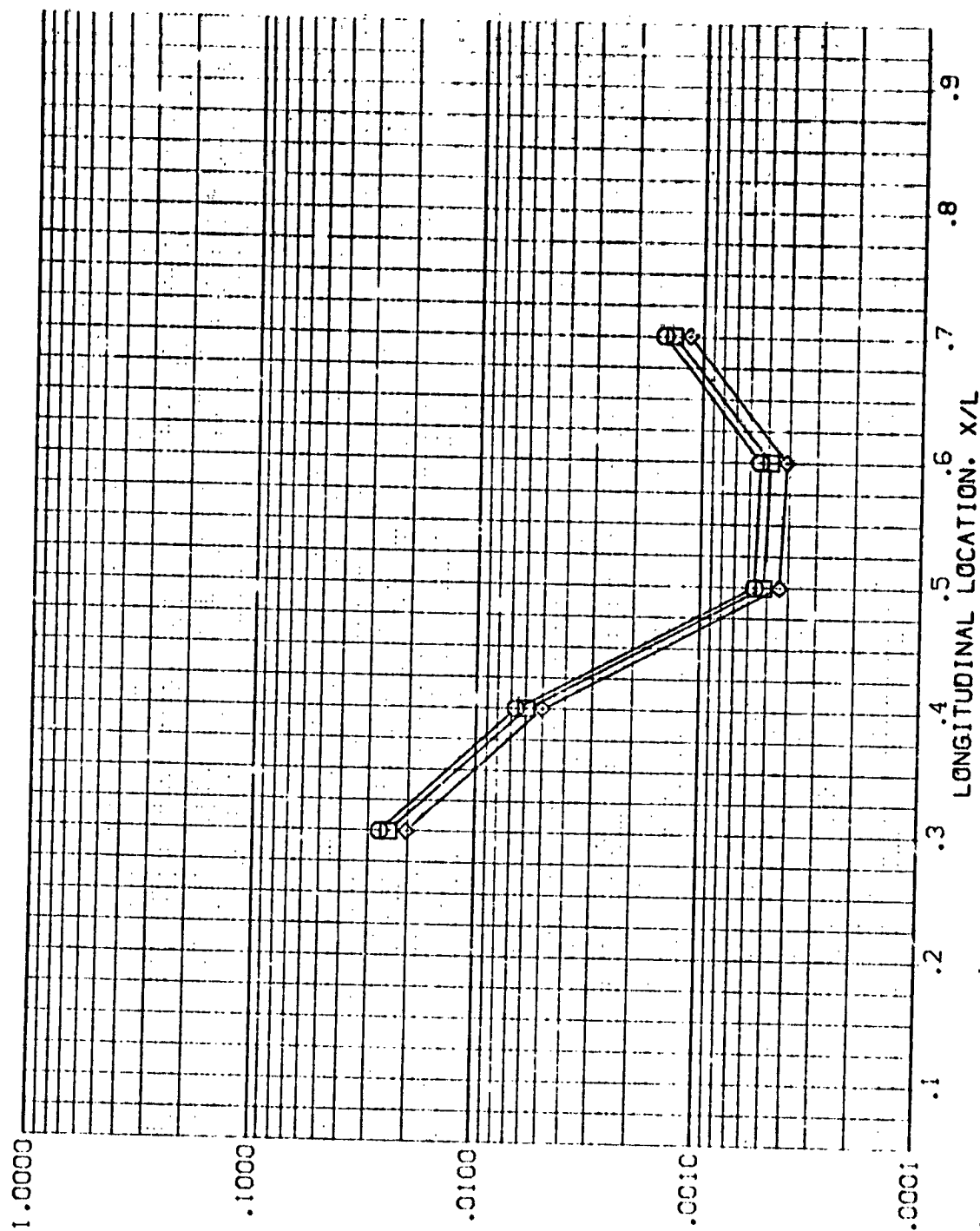


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REV 921)

BODY SIDEWALL

AYES 3.5-195 IH28 01

SYMBOL  
HAW/H  
.850  
.900  
1.000

Z  
425.000

MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
60.000  
RN/L  
1.000  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

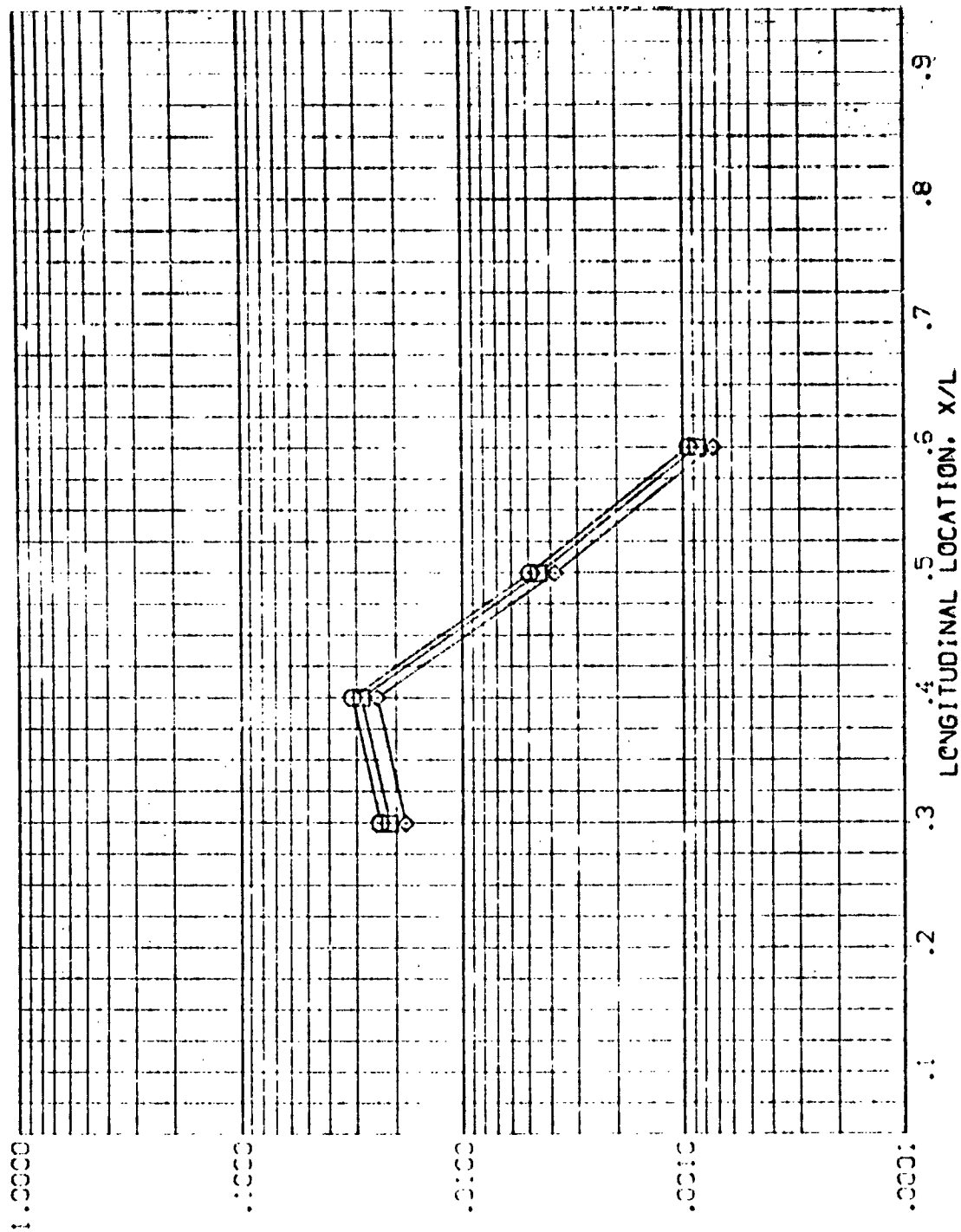


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REV8211)

AMES 3.5-195 IH28 01 BODY SIDEWALL

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 P<sub>W</sub>/L 1.000

SYMBOL MAP/HT Z MACH  
 ◇ .850 501.000 5.220  
 □ .900  
 □ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

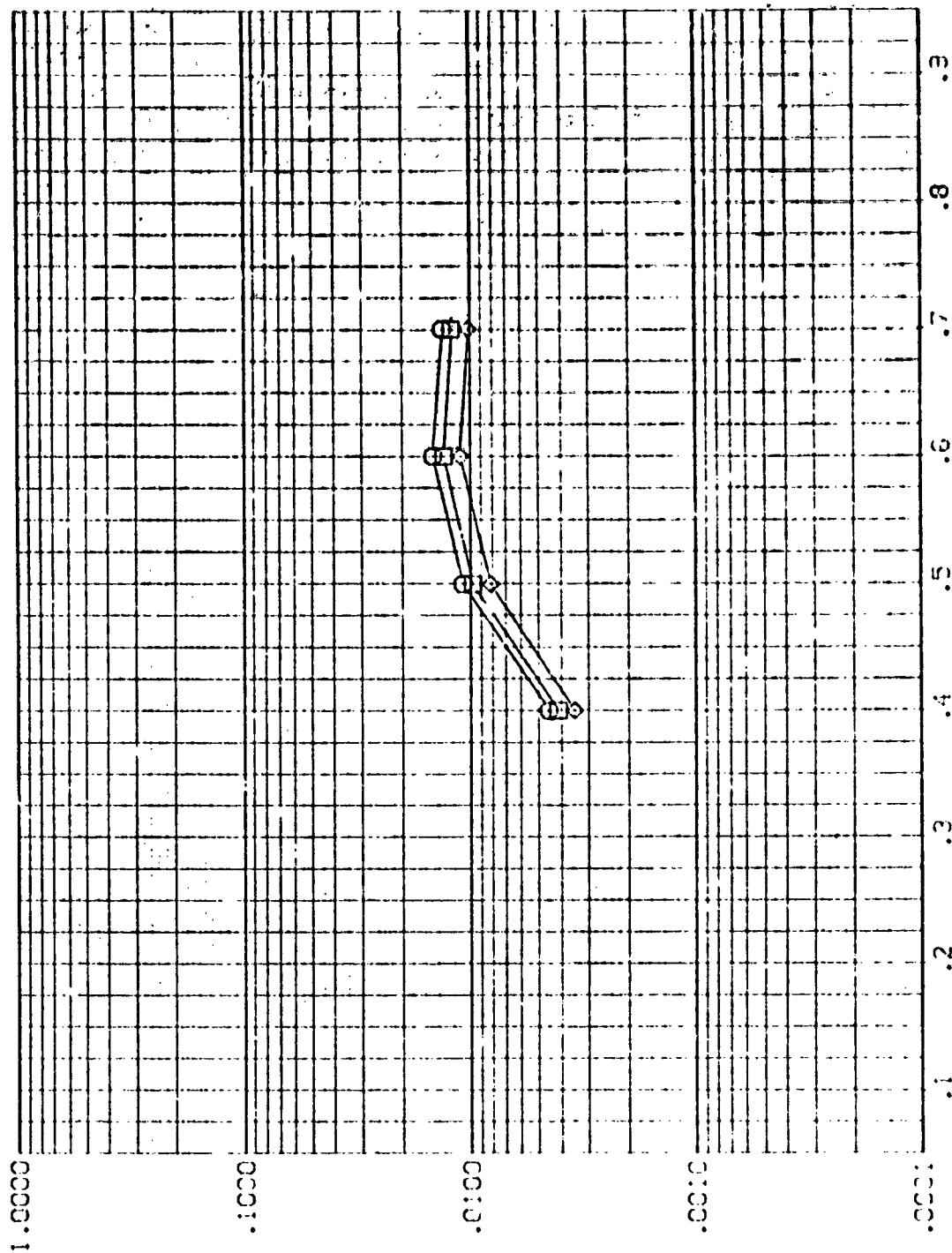


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 3.5-195 1H28 01 BODY SIDEWALL (FEV822)

SEVERAL  
 .850  
 .900  
 .950  
 1.000

ALPHA  
 0.000  
 0.005  
 0.010  
 0.015

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

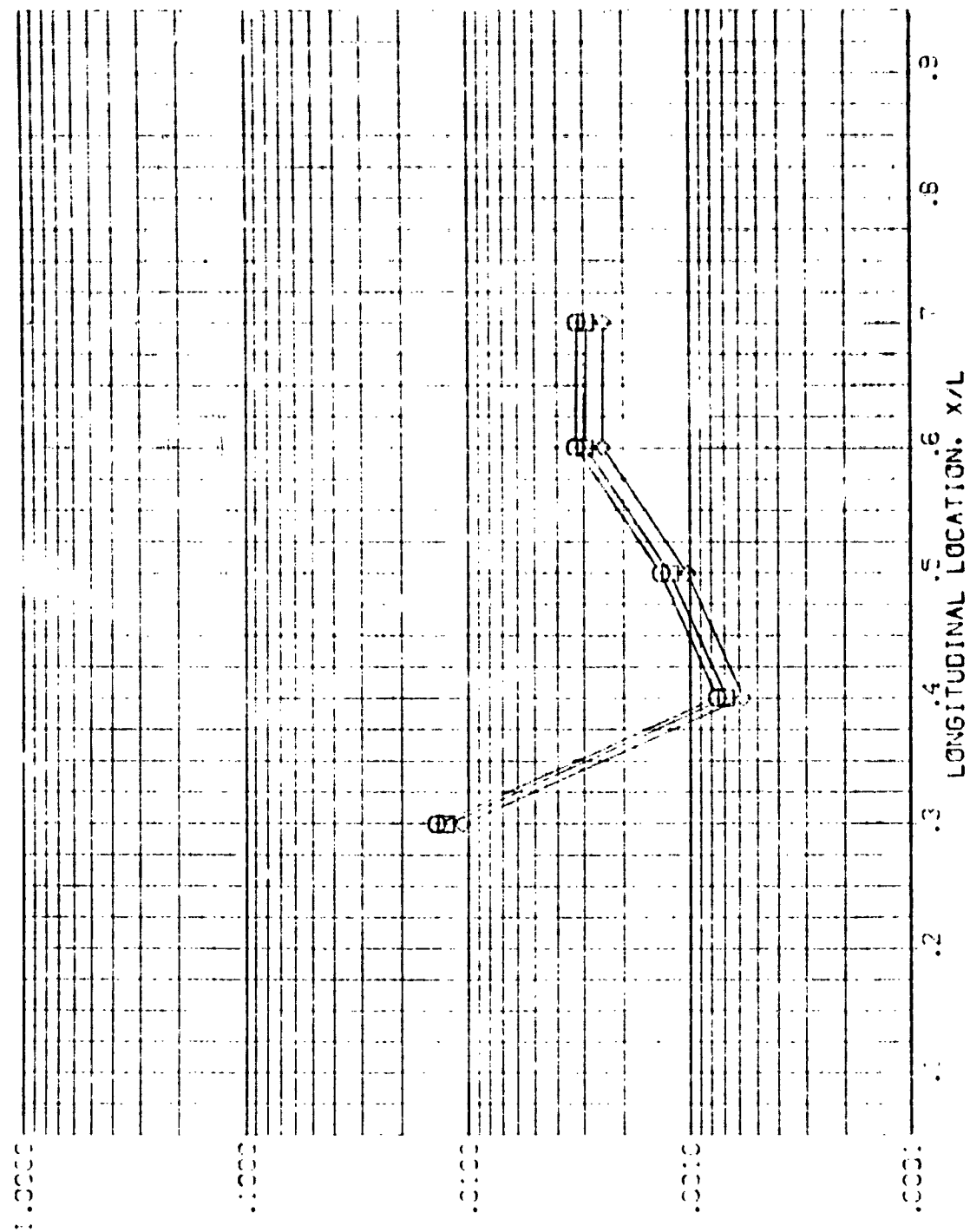


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 2.5-195 1428 01 BODY SIDEWALL (RE: 922)

SYNCD	MAV/MT	Z	MICH	PARAMETRIC VALUES
0.000	0.850	425.000	5.220	90.000 ALPHA
1.000	0.900			1.000 BETA
				0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

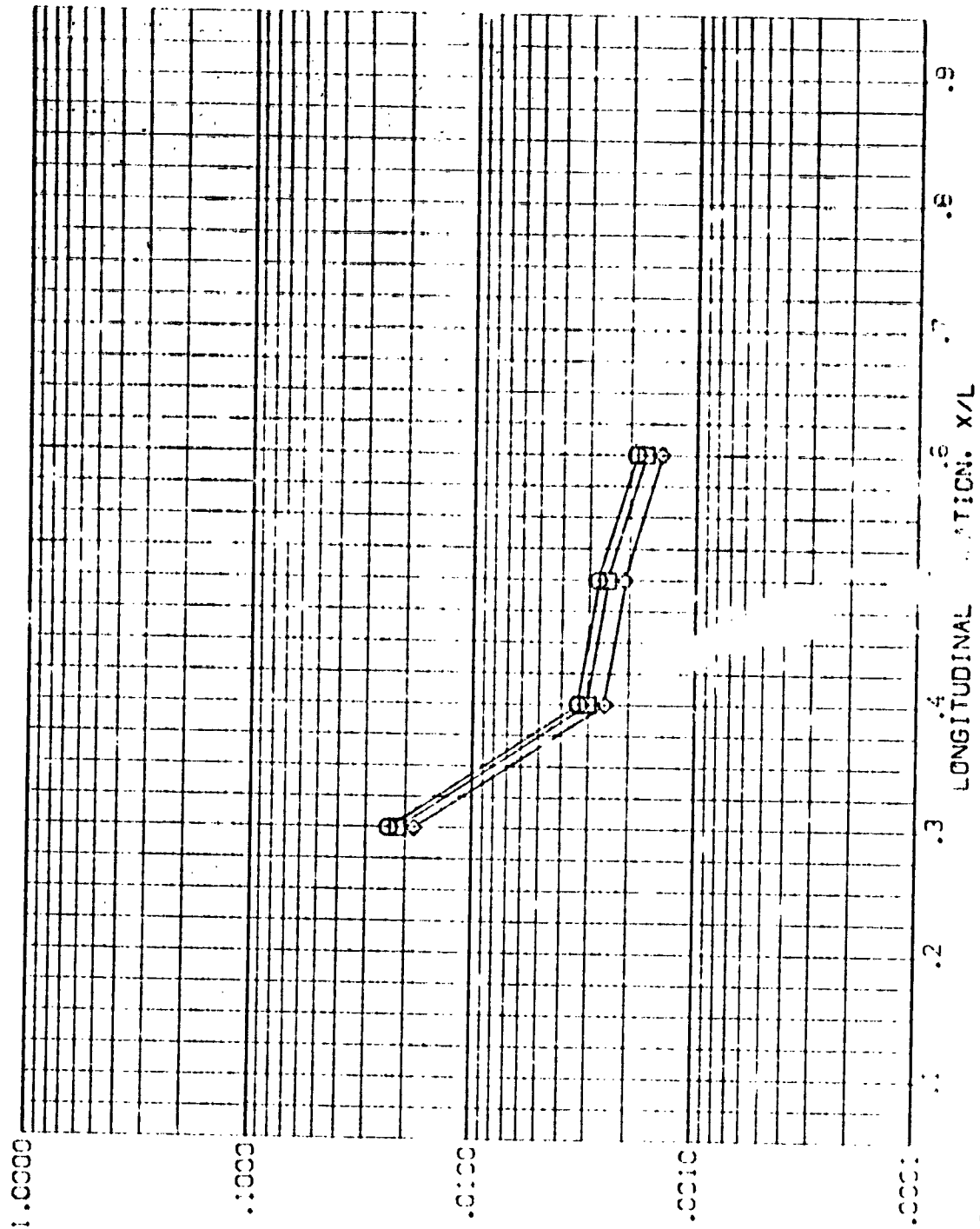


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALLOY



SYMBOL  
 H+H/H  
 .850  
 .900  
 1.000

Z  
 501.000  
 MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RM/L  
 50.000  
 1.000  
 SETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

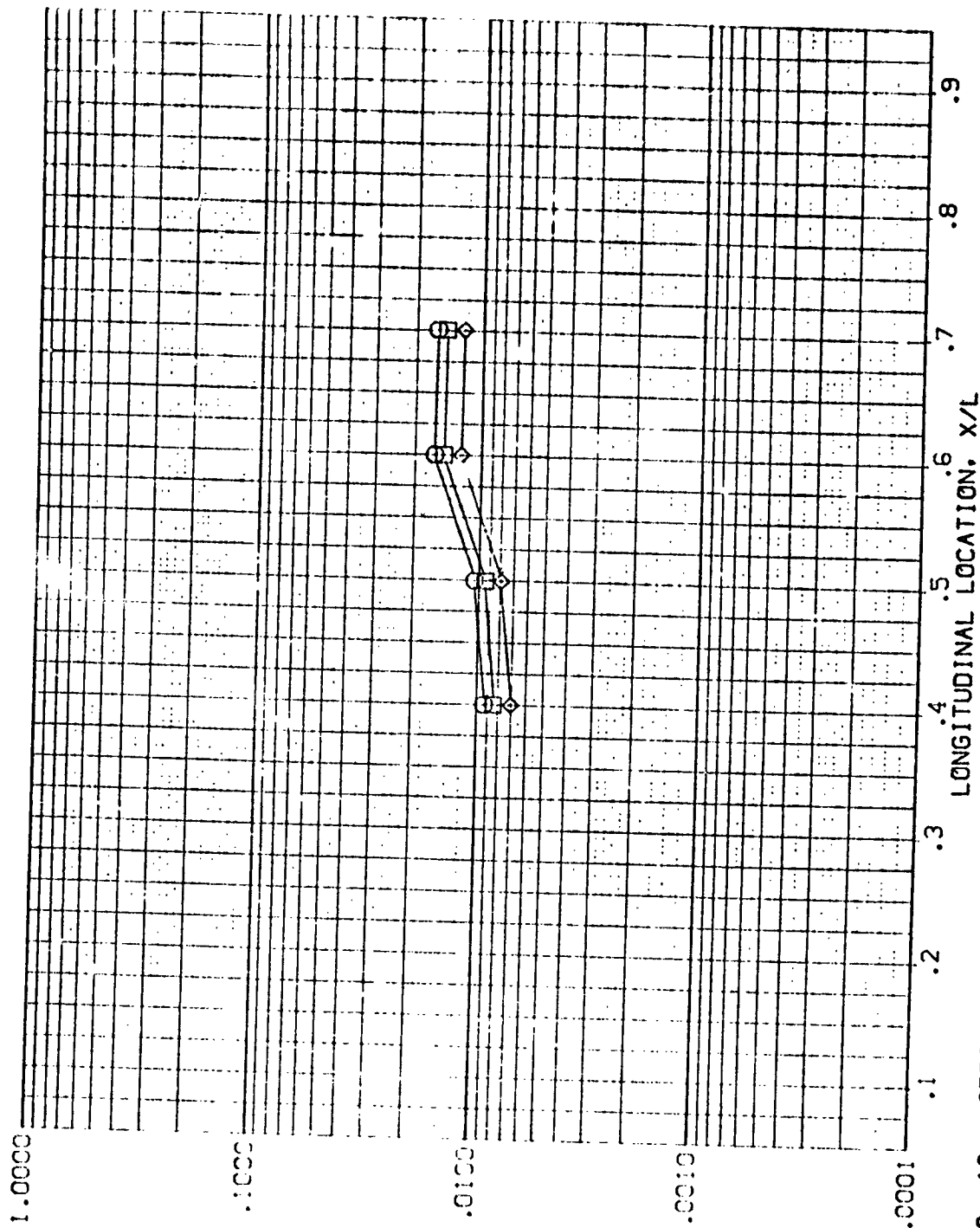


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL (REVB23)

SYMBOL	HA/WALL	Z	MACH	PARAMETRIC VALUES
◇	.850	.375 .000	5.220	12C .000 BETA .000
□	.900			1.000
◇	1.000			

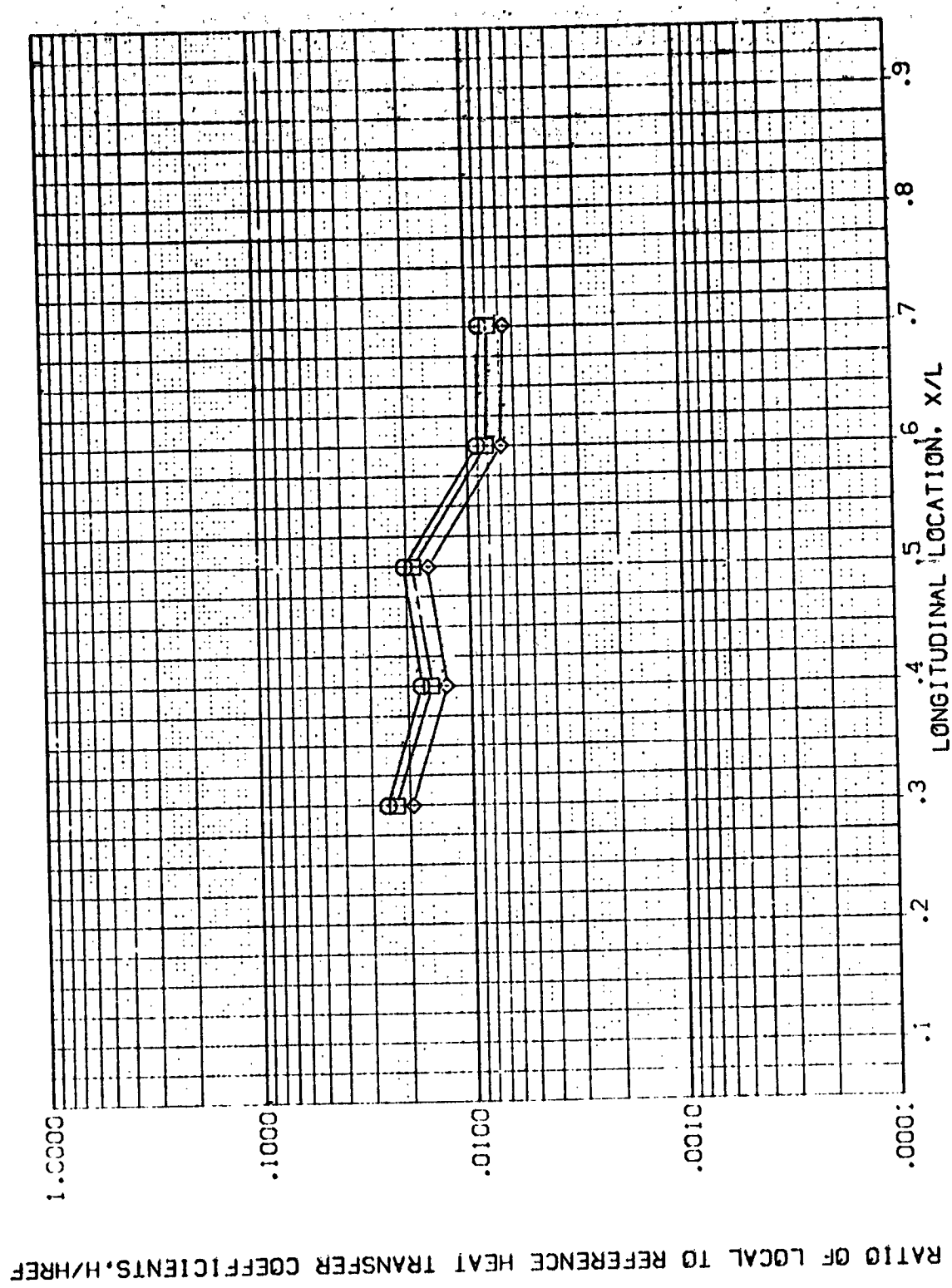


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB23)

BODY SIDEWALL

AYES 3.5-195 IH28 01

PARAMETRIC VALUES  
ALPHA 120.000 BETA .000  
RN/L 1.000

SYMBOL HAW/H<sub>T</sub> Z MACH  
◇ .850 425.000 5.220  
□ .900  
○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

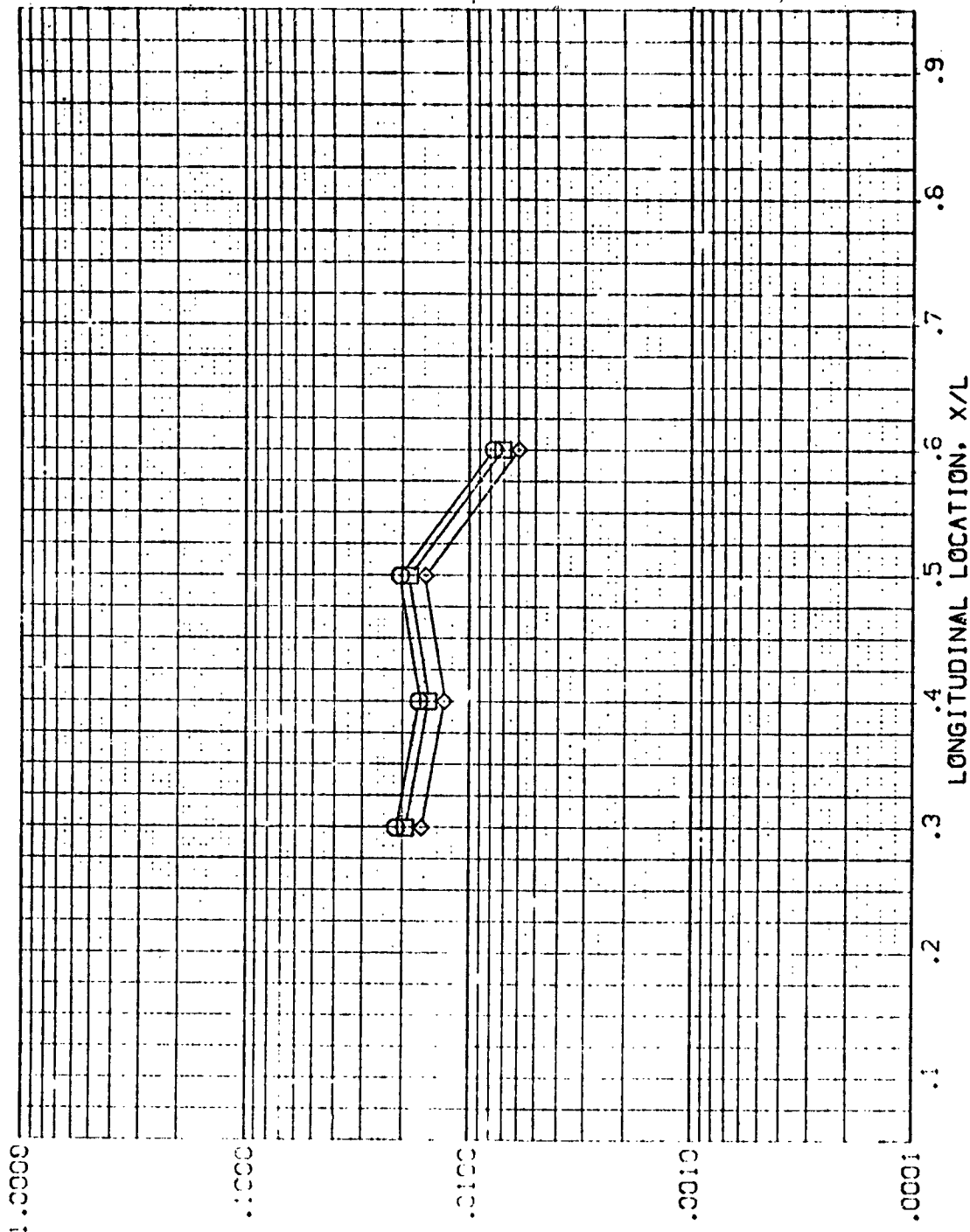


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REV B23)

SYSEC. HAY/HT Z MACH  
 .850 501.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 12°.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

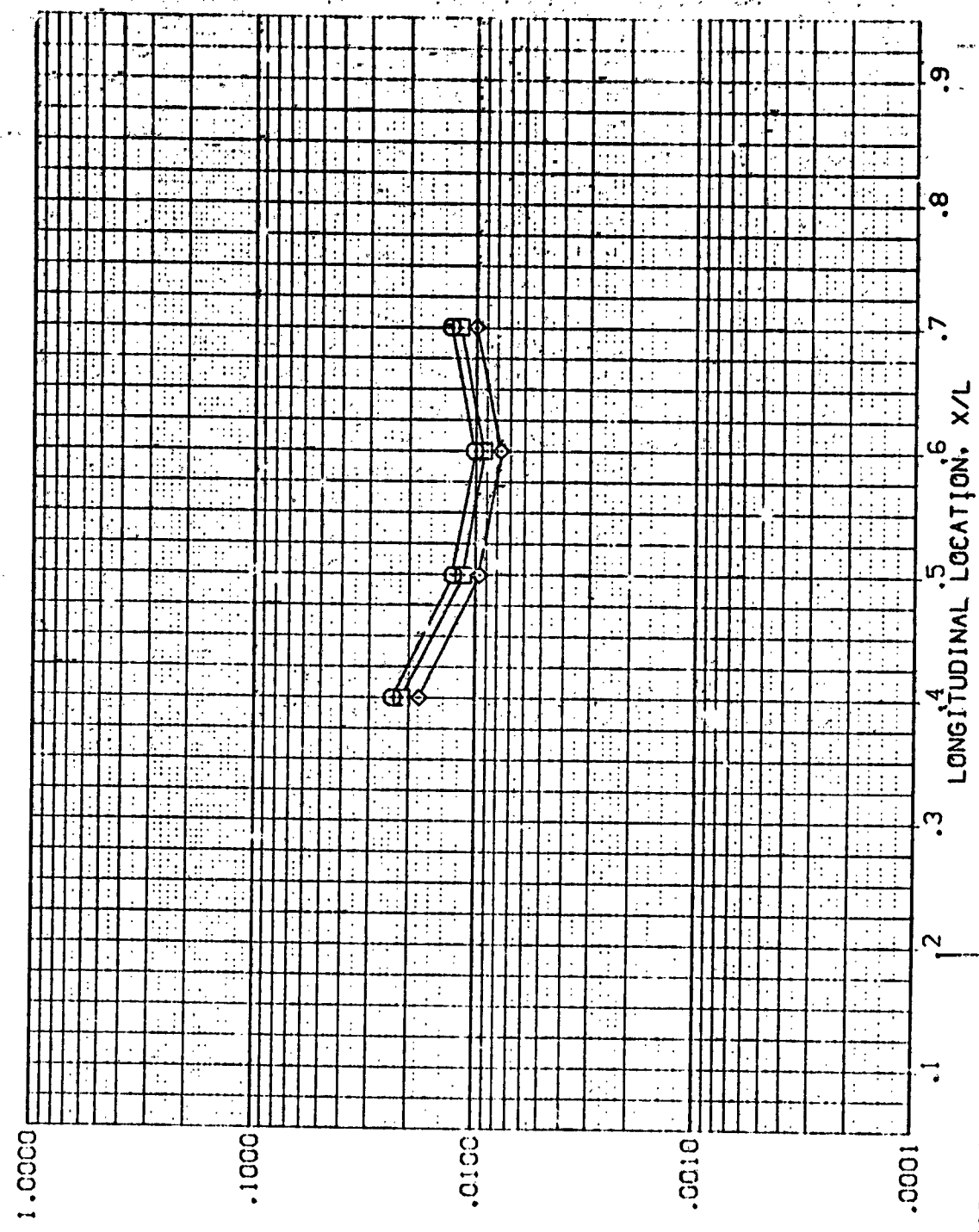


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 0: BODY SIDEWALL (REVB24)

SYMBOL  
 □  
 ◇

MAN/HT Z MACH  
 .850 375.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

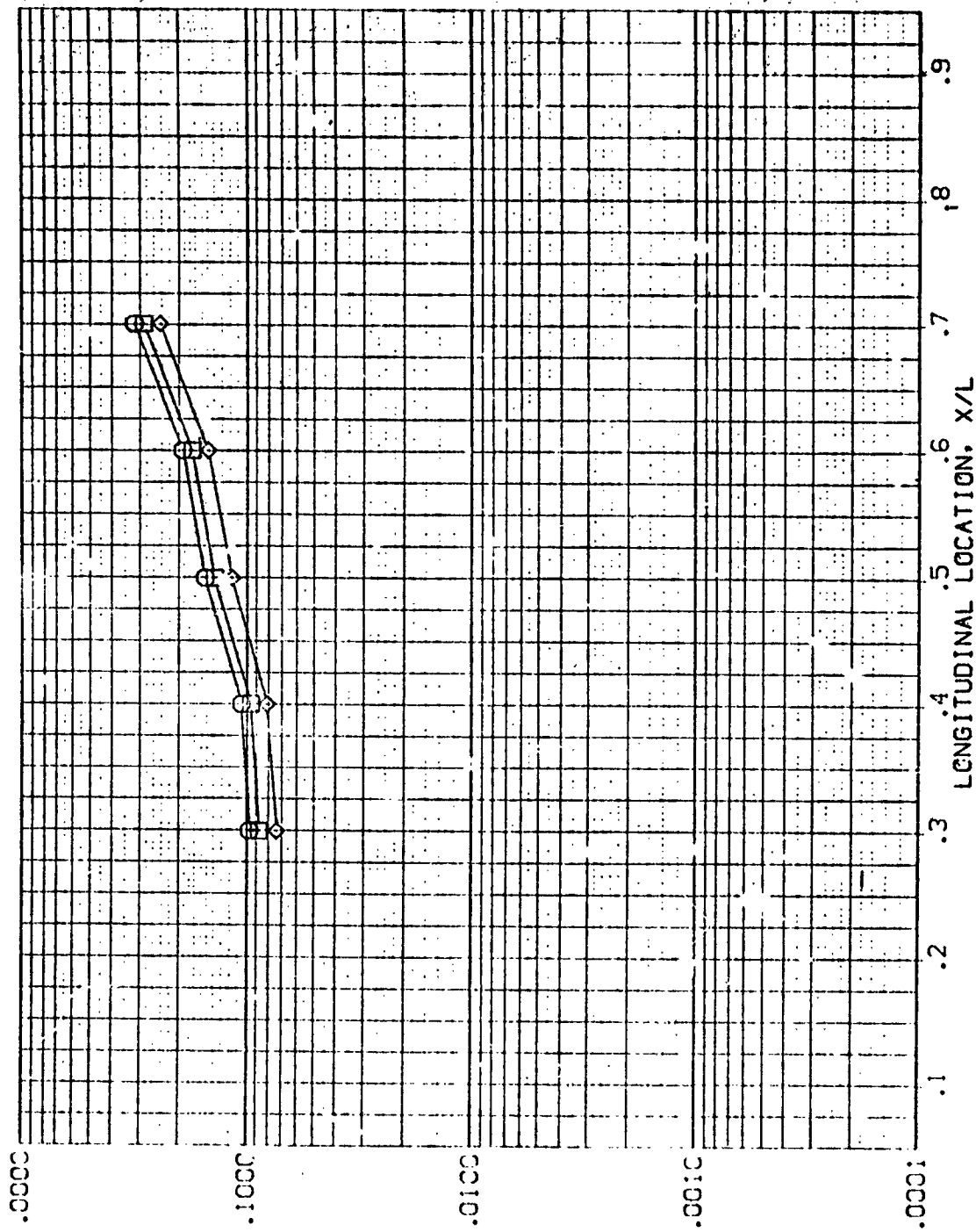


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL (REV24)  
 SY-BCL HAW/HT Z MACH  
 .850 425.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

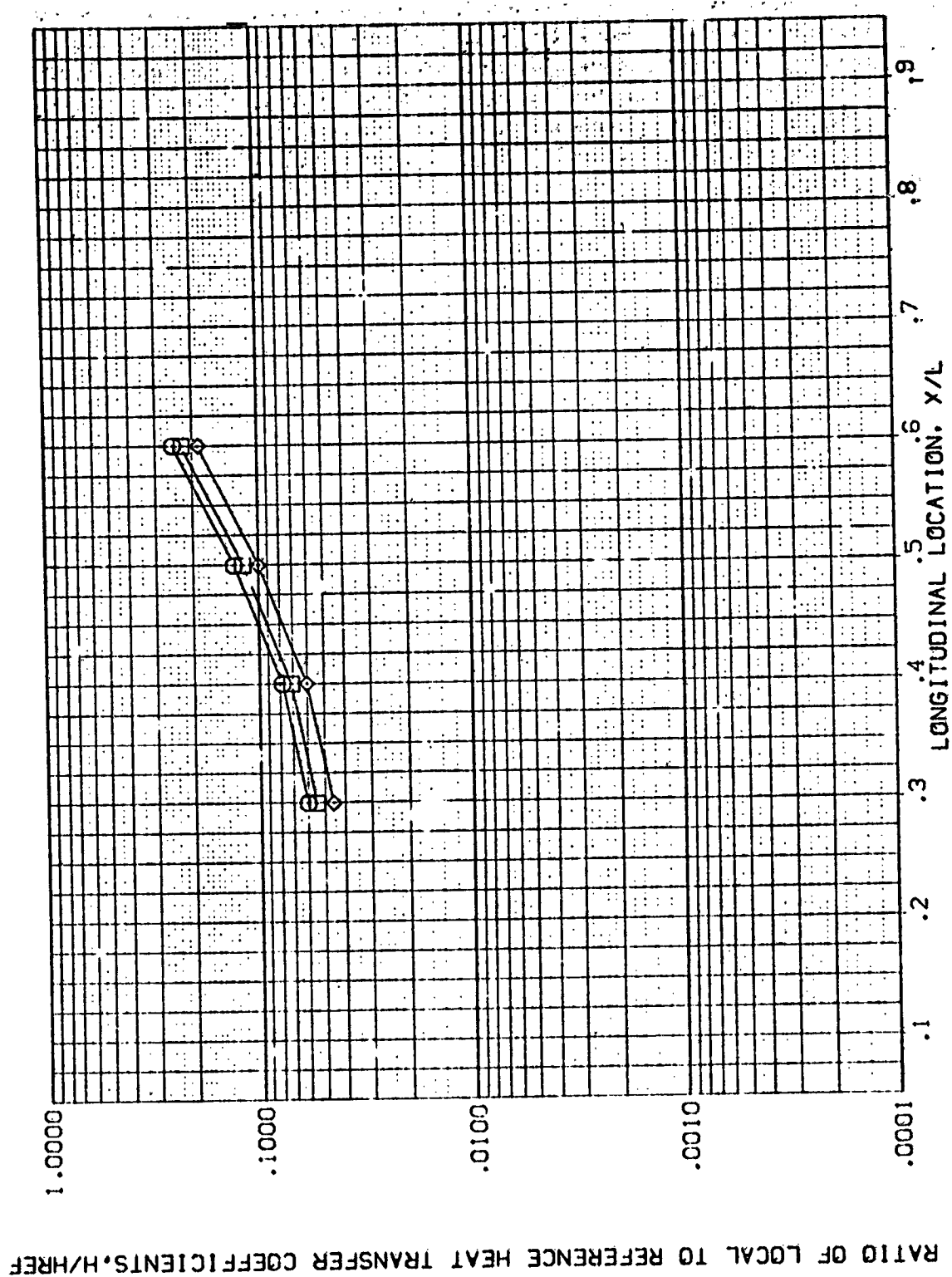


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB24)

SYMBOL:  $\square$   $\diamond$   
 HAW/HT .850  
 Z 501.000  
 MACH 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -12.000  
 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

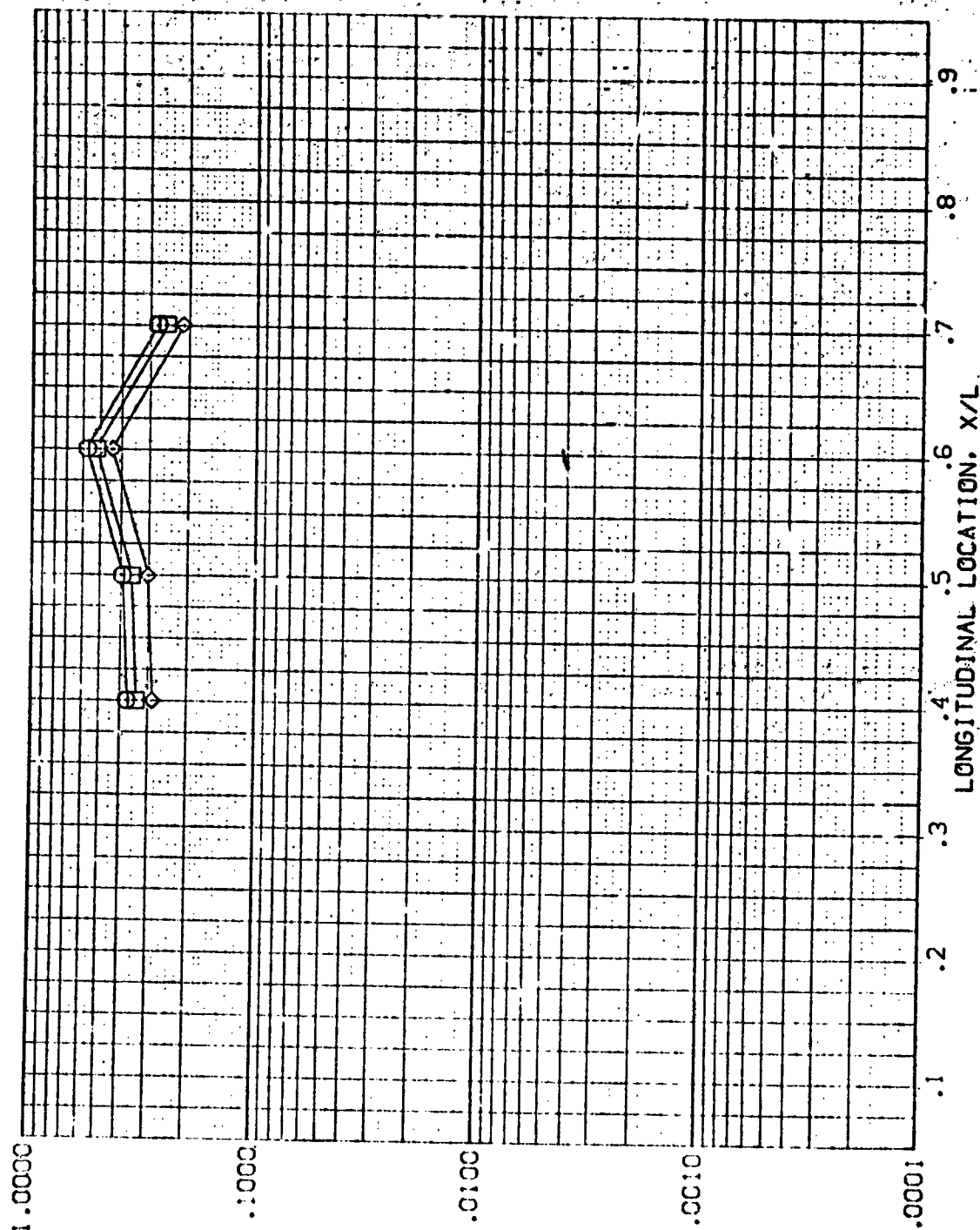


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB25)

SYMBOL X/Y/Z MACH  
 □ .850 375.038 5.219  
 □ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 -90.000 ALPHA  
 .000 BETA  
 .300

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

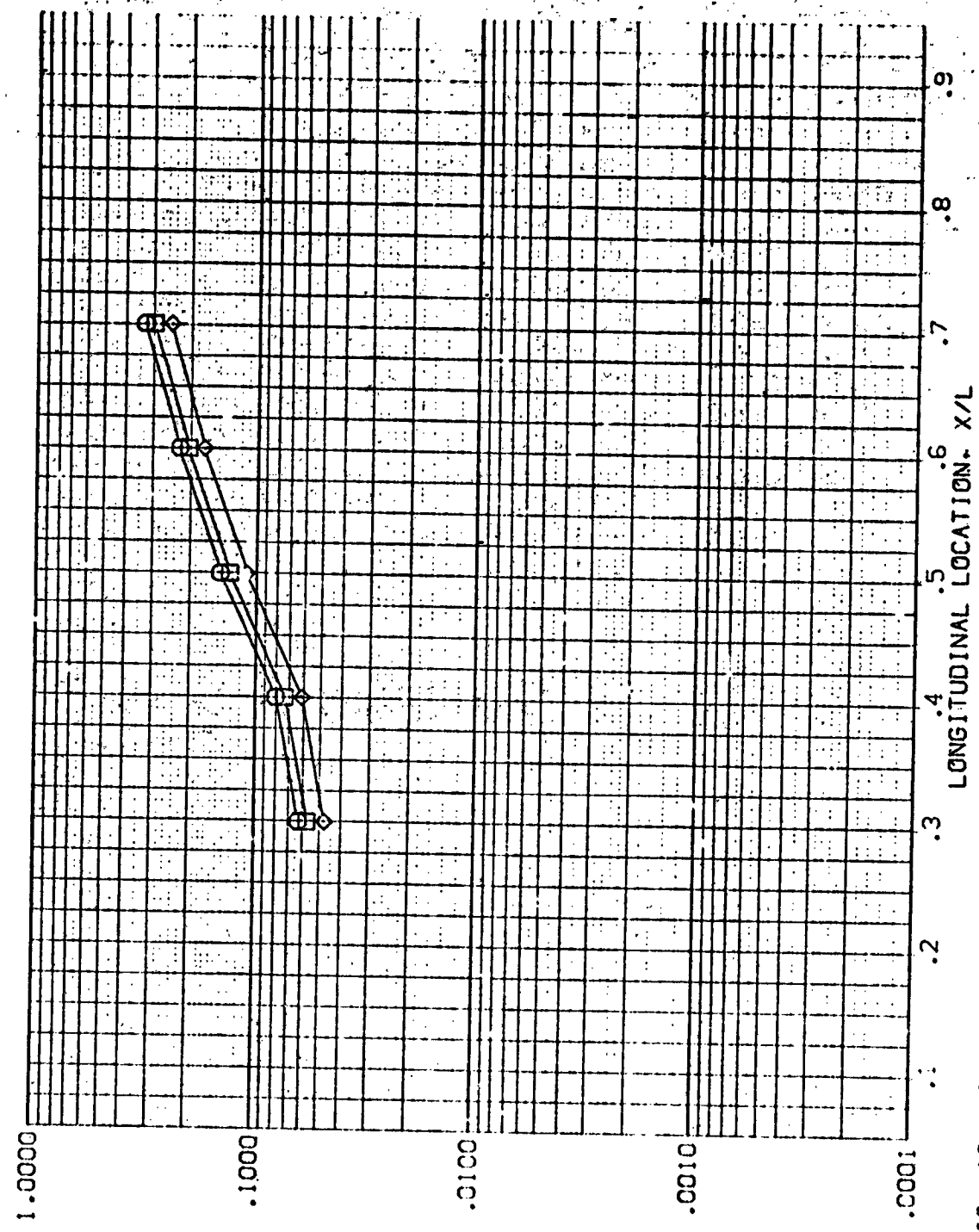


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AMES 3.5-195 IH28 01 BODY SIDEWALL

(REV825)

SYMBOL  
 ◇ □

MAV/FT 2 MACH  
 .850 425.000 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

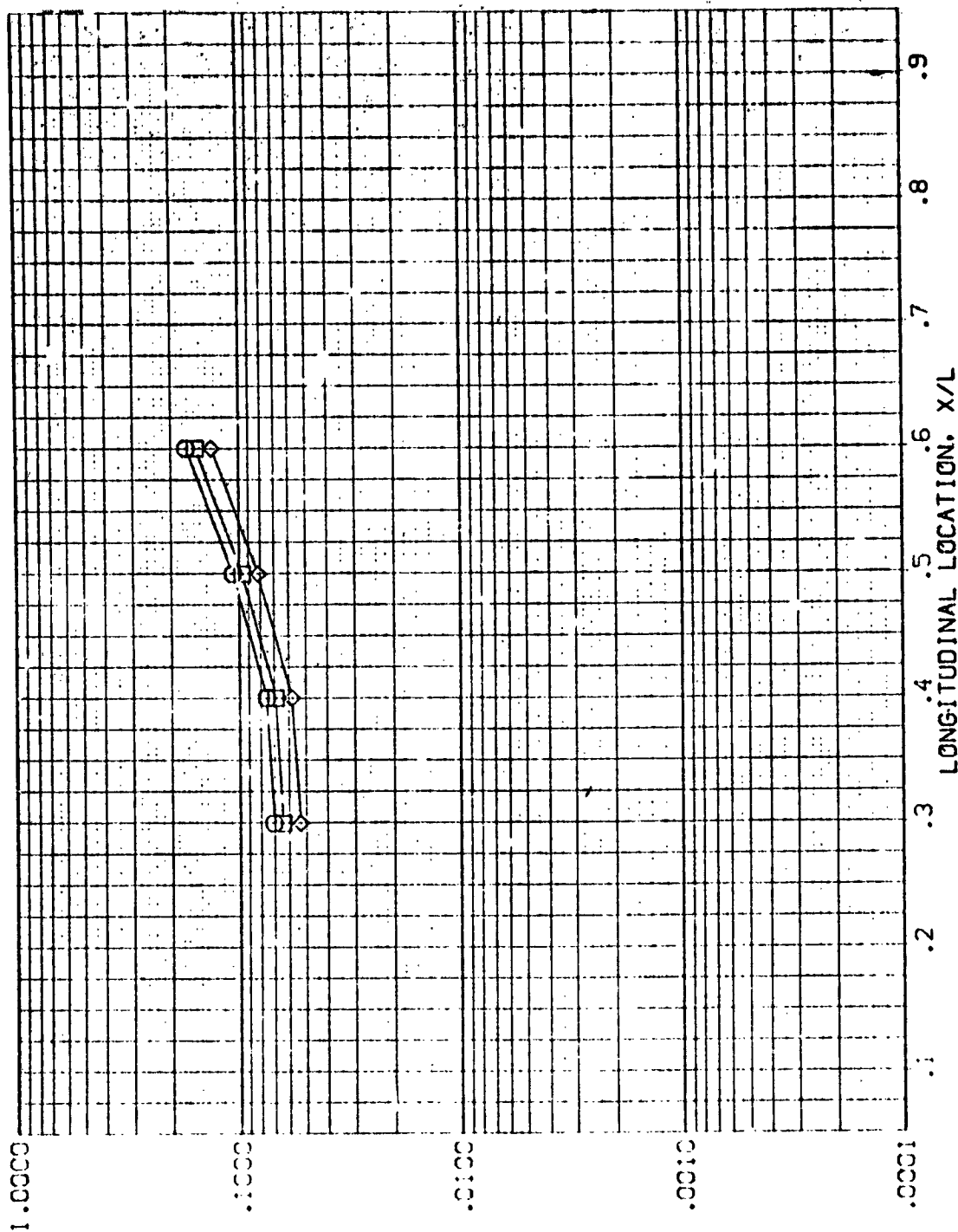


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB25)

SYMBOL  $\diamond$

MAN/HT .850  
Z 501.000  
MACH 5.219  
.900  
1.000

PARAMETRIC VALUES  
ALPHA RN/L  
-9L.000 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

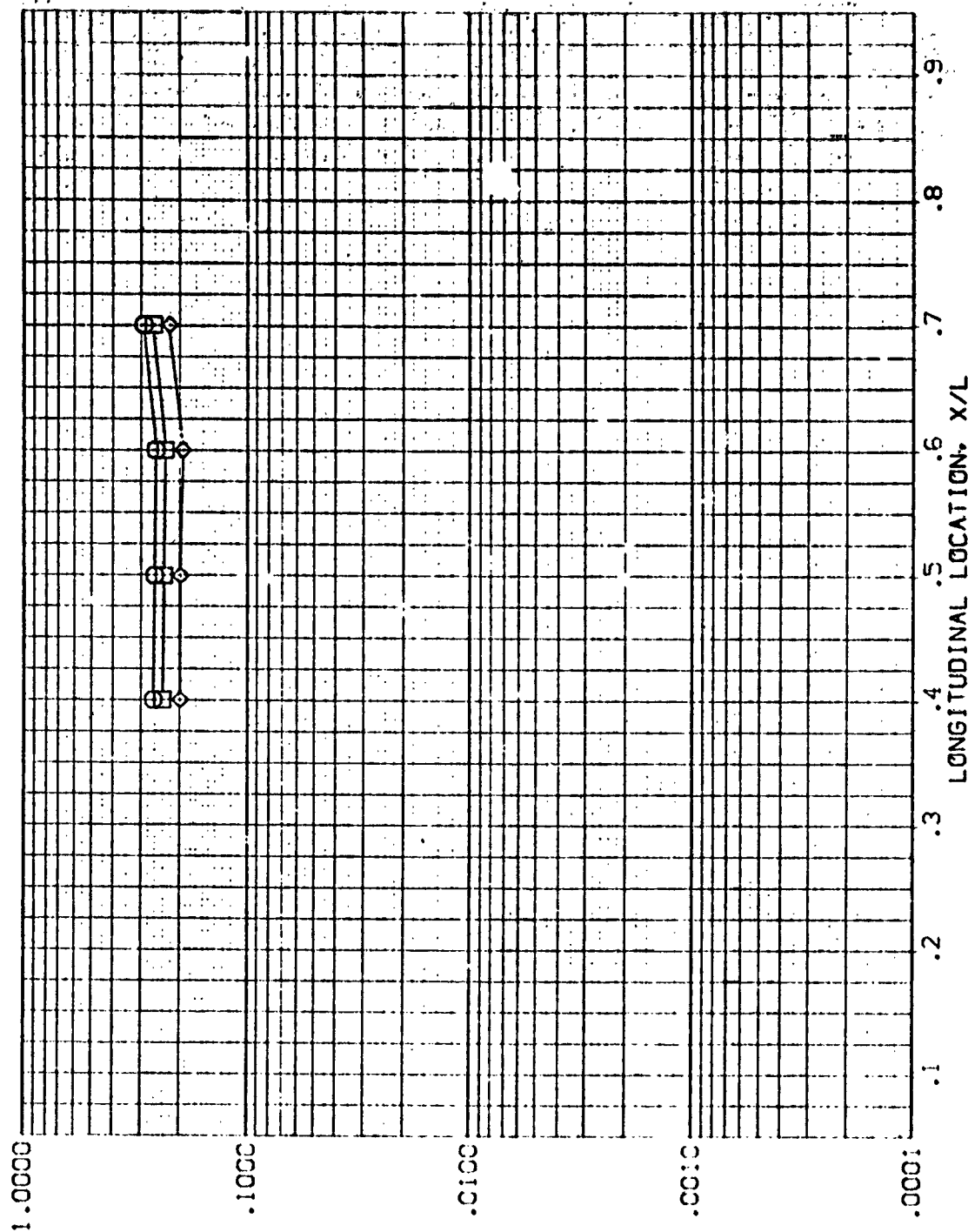


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB26)

AMES 3.5-135 IH28 01 BODY SIDEWALL

PARAMETER VALUES

ALPHA  
RN/L

BETA  
1.00

MACH  
5.220

Z  
375.000

SYMBOL  
HAB/H  
.850  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

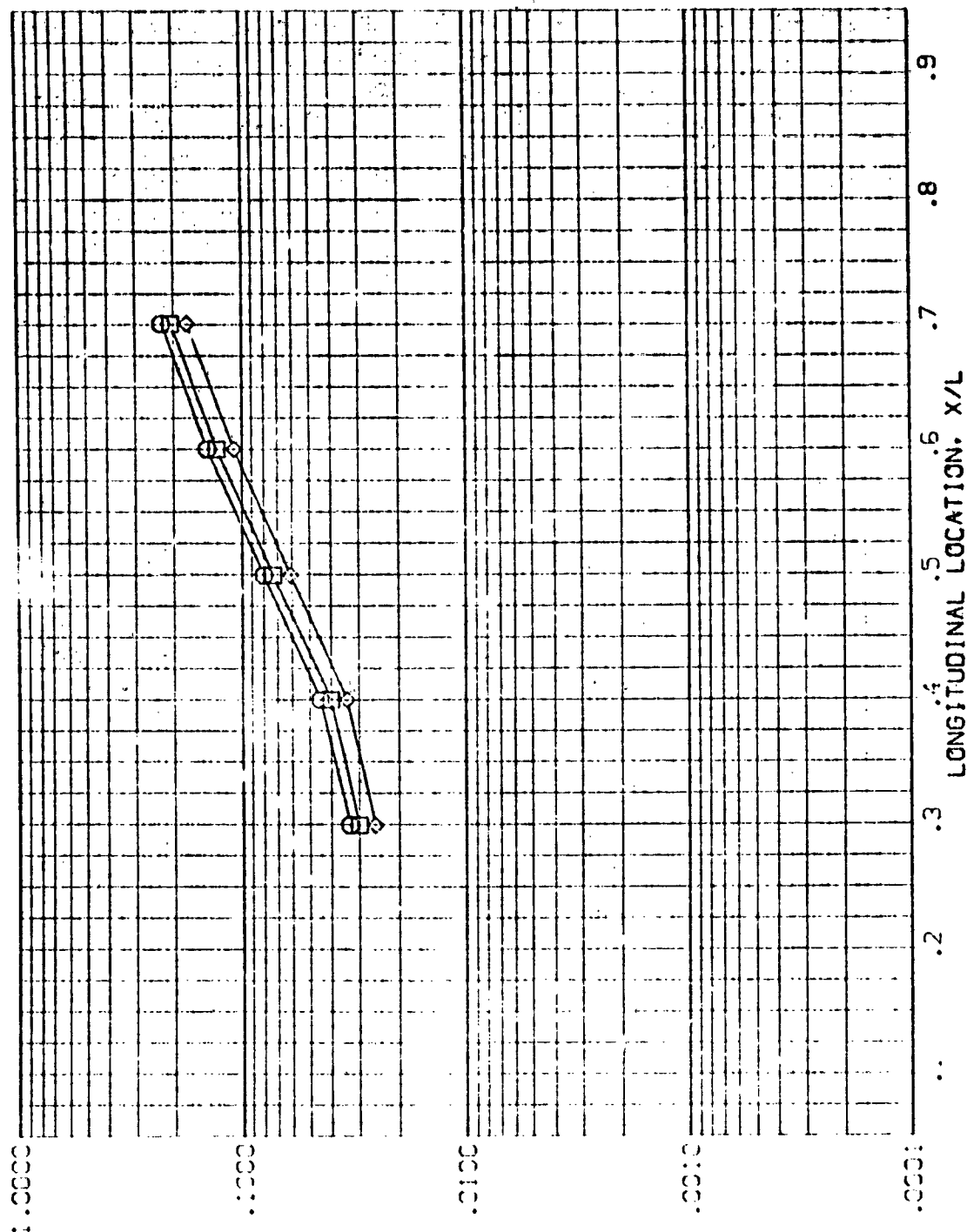


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB26)

SYMBOL MACH 2 425.000 5.220  
 .850  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -6.000  
 RV/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

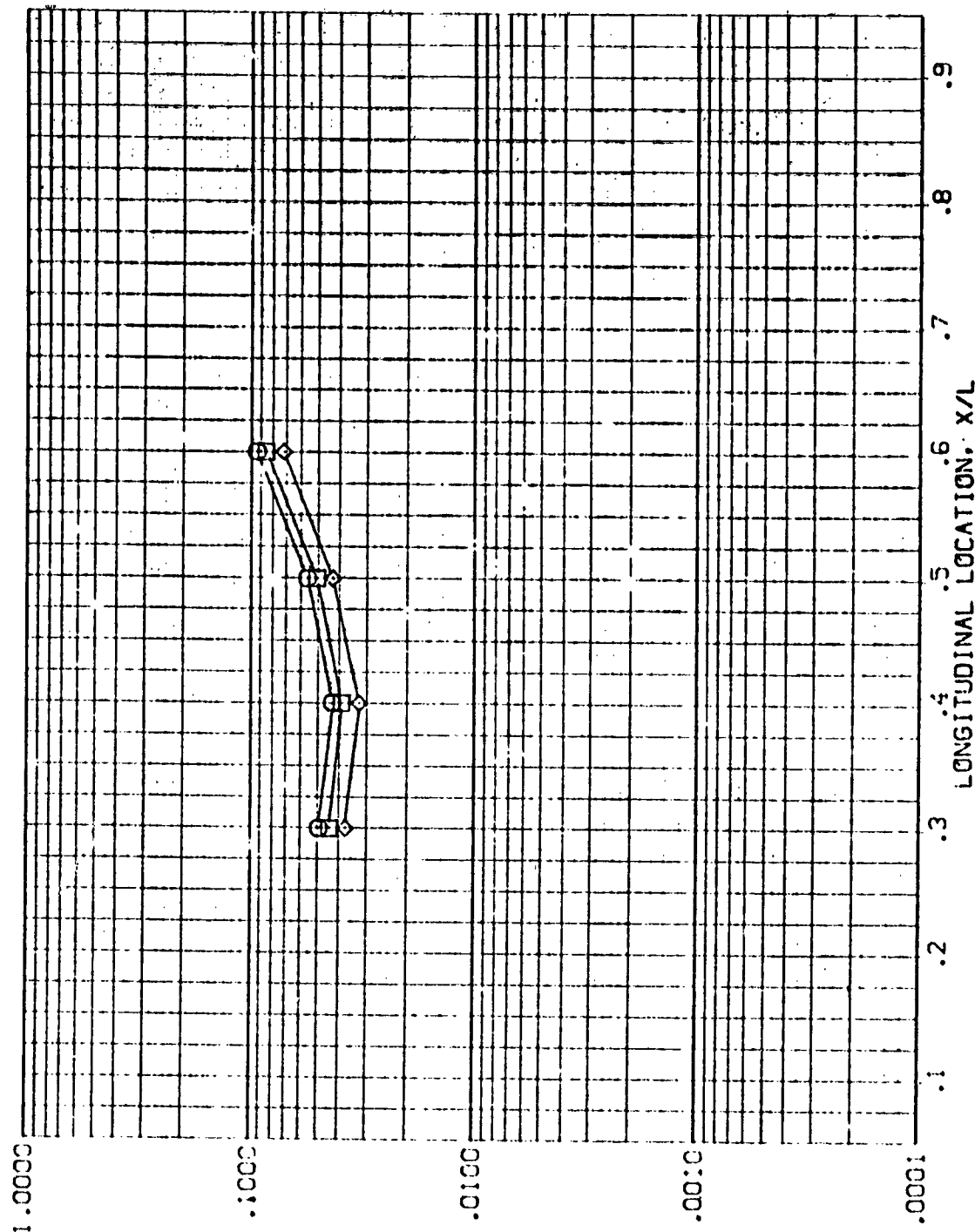


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REV B26)

AMES 3.5-195 1H28 01 BODY SIDEWALL

SYMBOL HAW/H<sub>T</sub> Z MACH

◇

□

○

.850 501.000 5.220  
.920  
1.000

PARAMETRIC VALUES  
ALPHA -50.000 SETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

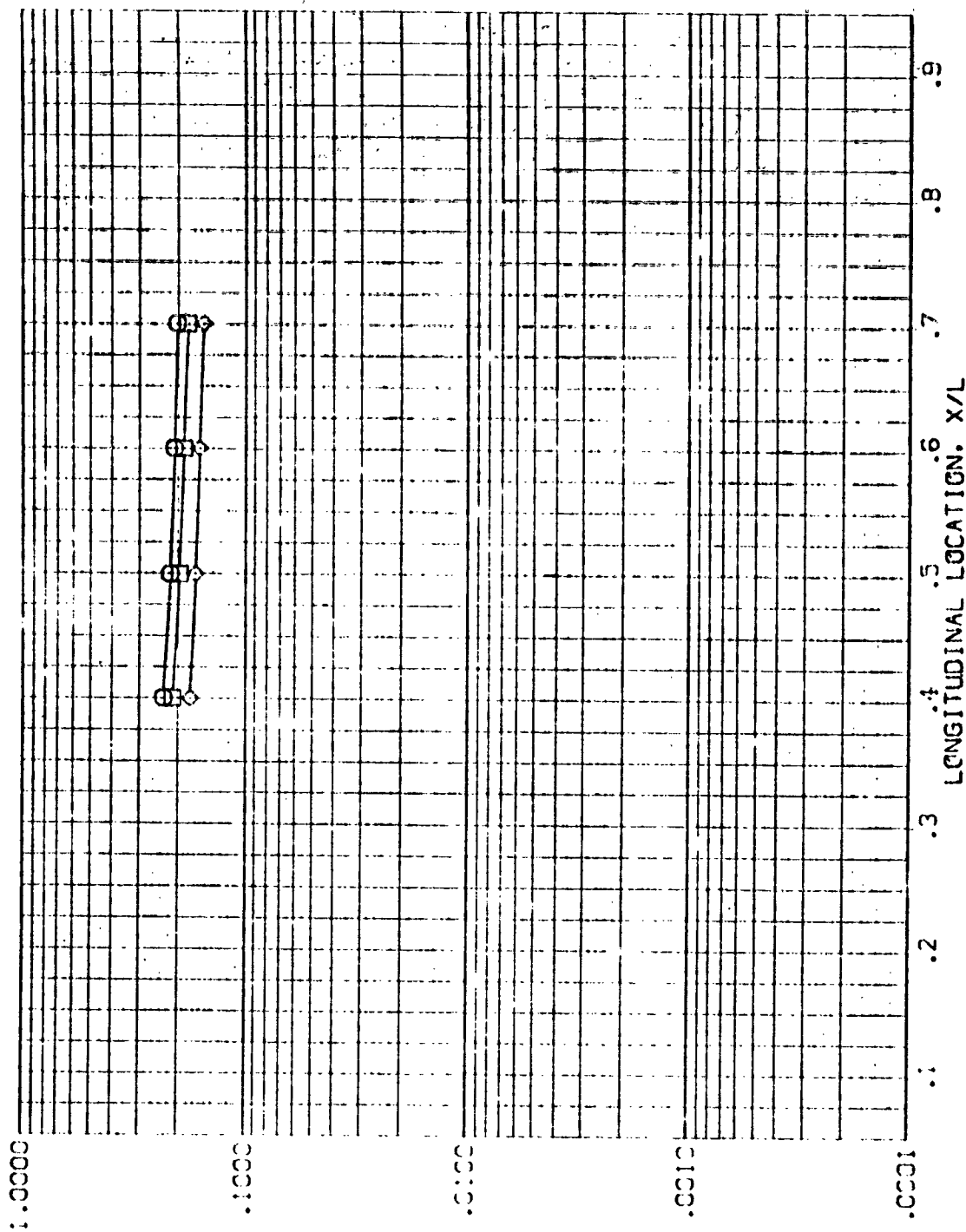


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL (REV827)

SYNTH. MACH. NO. 2 MACH. NO. 375.000 5.220  
 .850  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

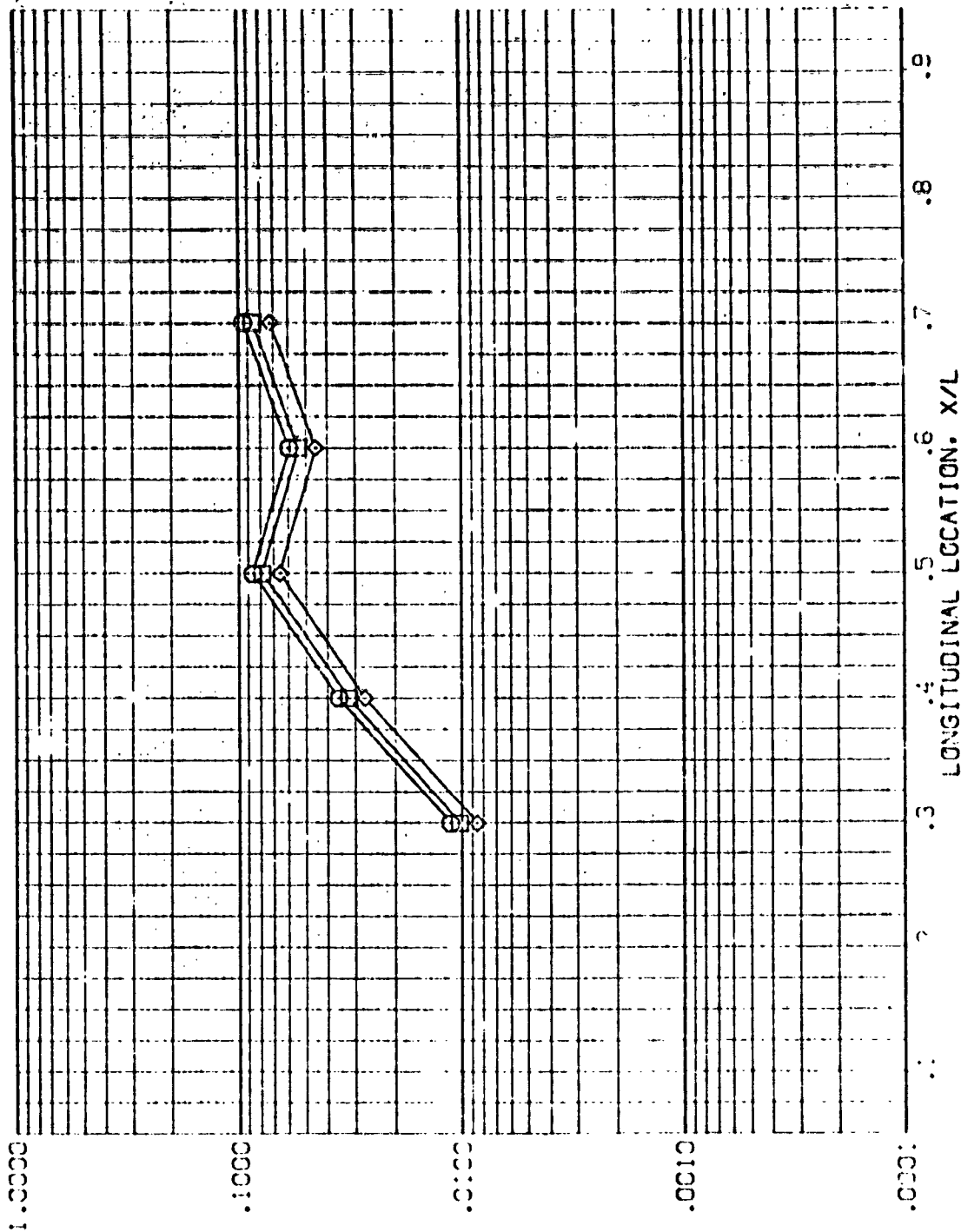


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB27)

AMES 3.5-195 1H28 01 BODY SIDEWALL

SYMBOL HAW/HT Z MACH

□ □ □  
- .850  
- .900  
- 1.000

425.000 5.220

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

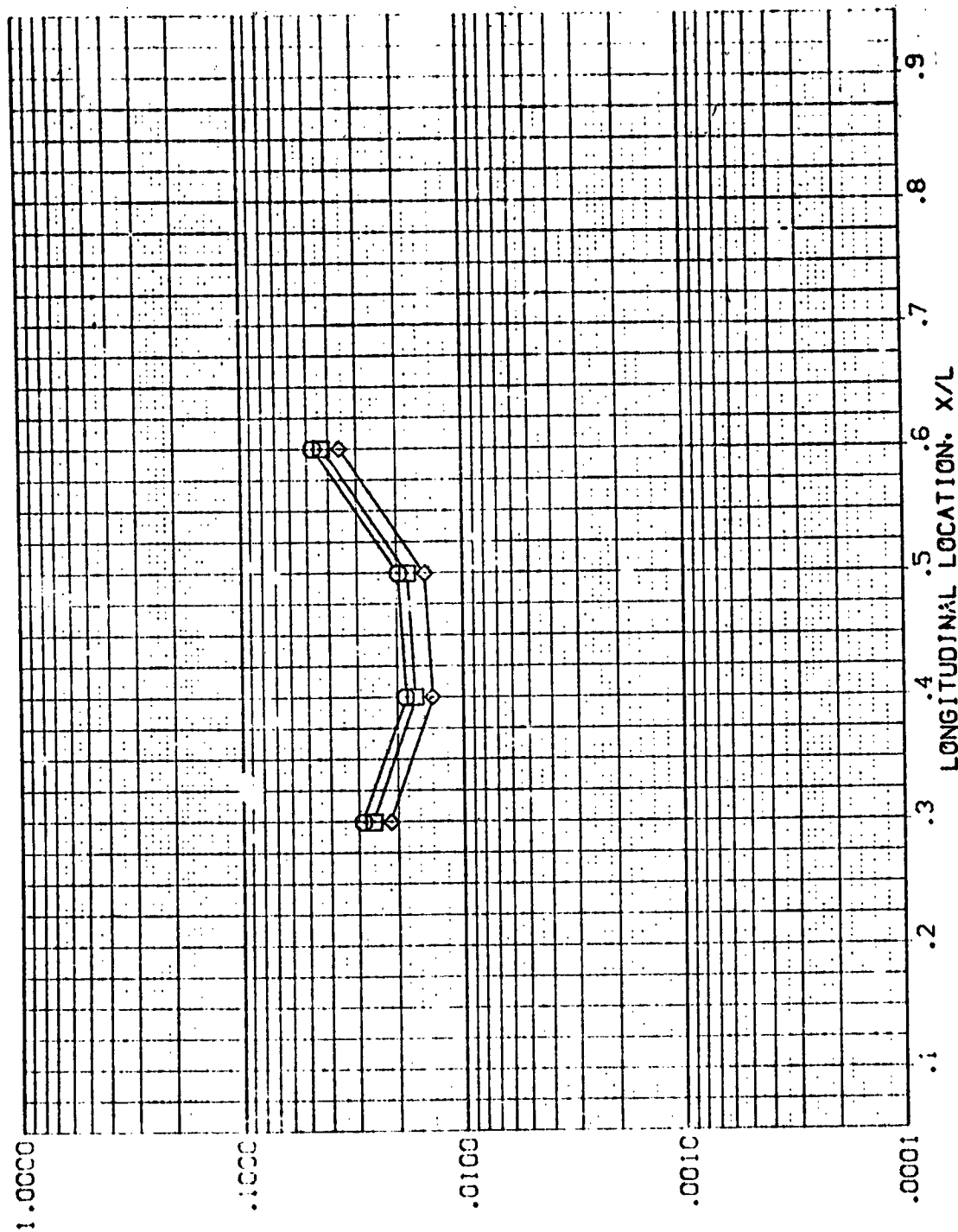


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB27)

AMES 3.5-195 IH28 01 BODY SIDEWALL

S<sub>1</sub> 35L  
 HAW/HT .853  
 Z 501.600  
 MACH 5.220  
 .930  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000  
 RN/L 1.000  
 BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

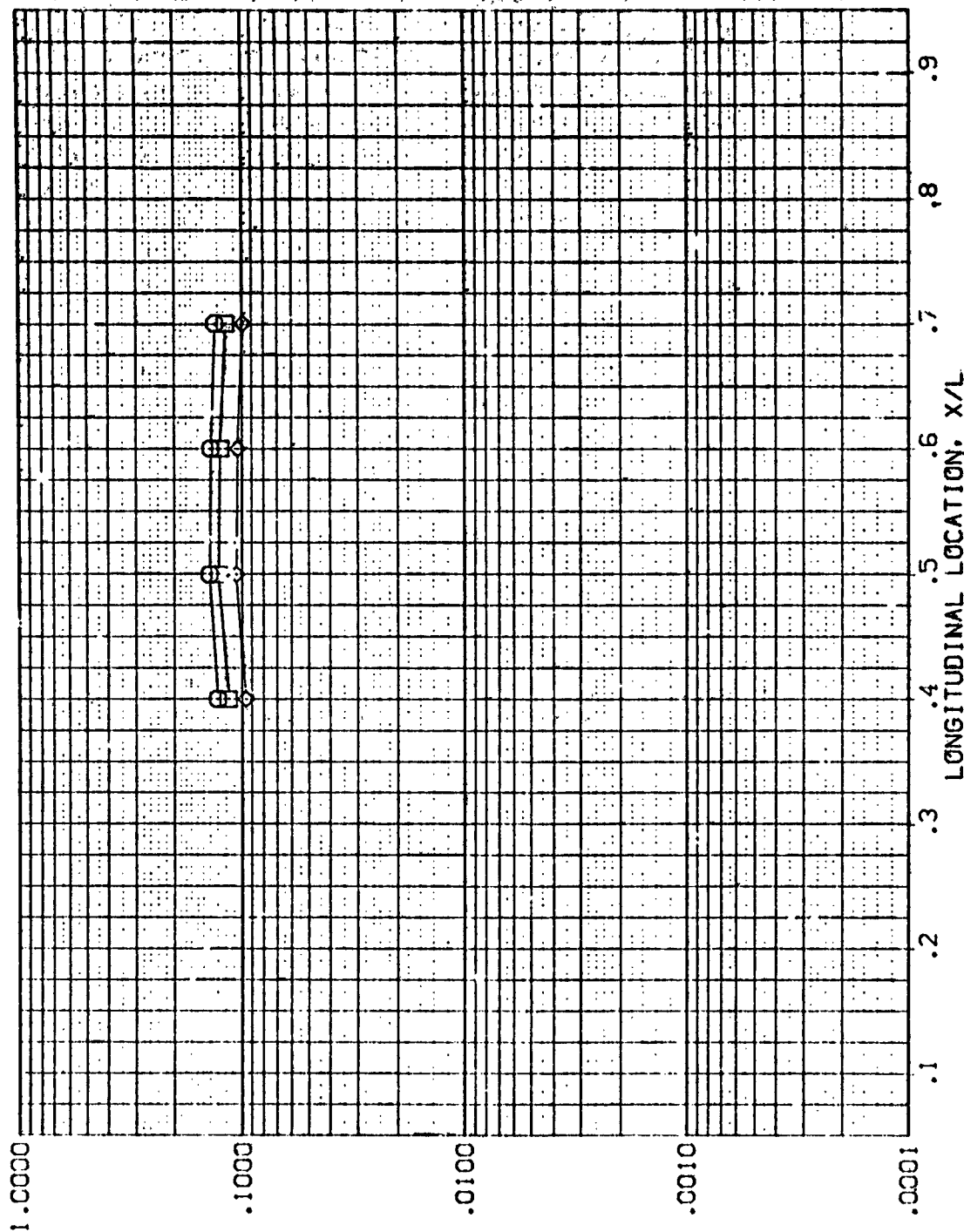


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AXES 3.5-195 IH28 01 BODY SIDEWALL (REVB19)

SYMBOL HAW/HT X/L MACH  
 □ .850 .300 5.220  
 ◇ .900  
 ◇ 1.000

PARAMETER VALUES  
 ALPHA .000  
 RV/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

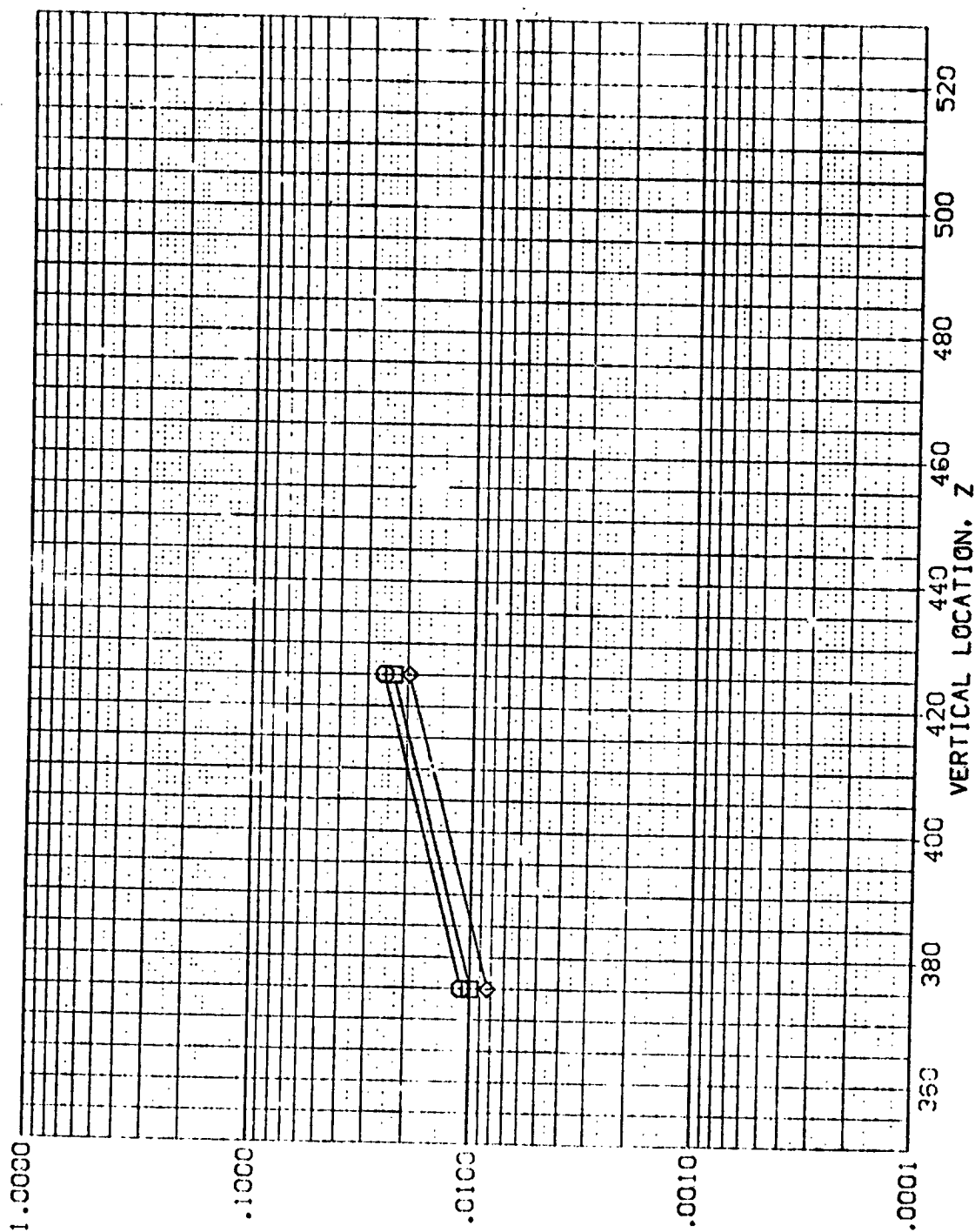


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB19)

SYMBOL  
 □  
 ◇  
 1.000

HAY/HT  
 .950  
 .900  
 .850  
 .800  
 .750  
 .700  
 .650  
 .600  
 .550  
 .500  
 .450  
 .400  
 .350  
 .300  
 .250  
 .200  
 .150  
 .100  
 .050  
 .000

MACH  
 5.220

X/L  
 .400

ALPHA  
 RN/L

PARAMETRIC VALUES  
 .000 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

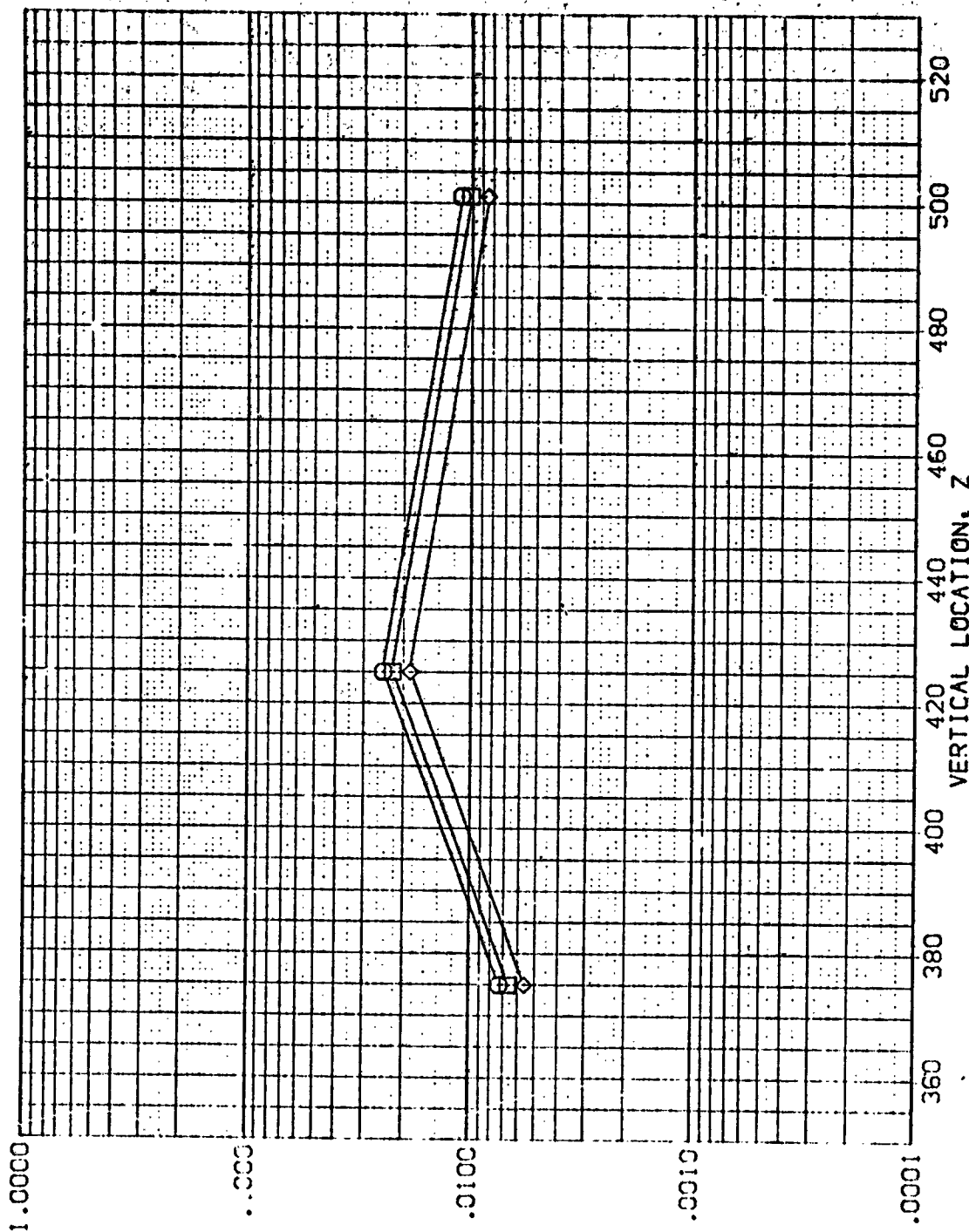


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

SYMBOL	HA/W-T	X/L	MACH	ALPHA	BETA
◇	.850	.500	5.220	.000	.000
◇	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

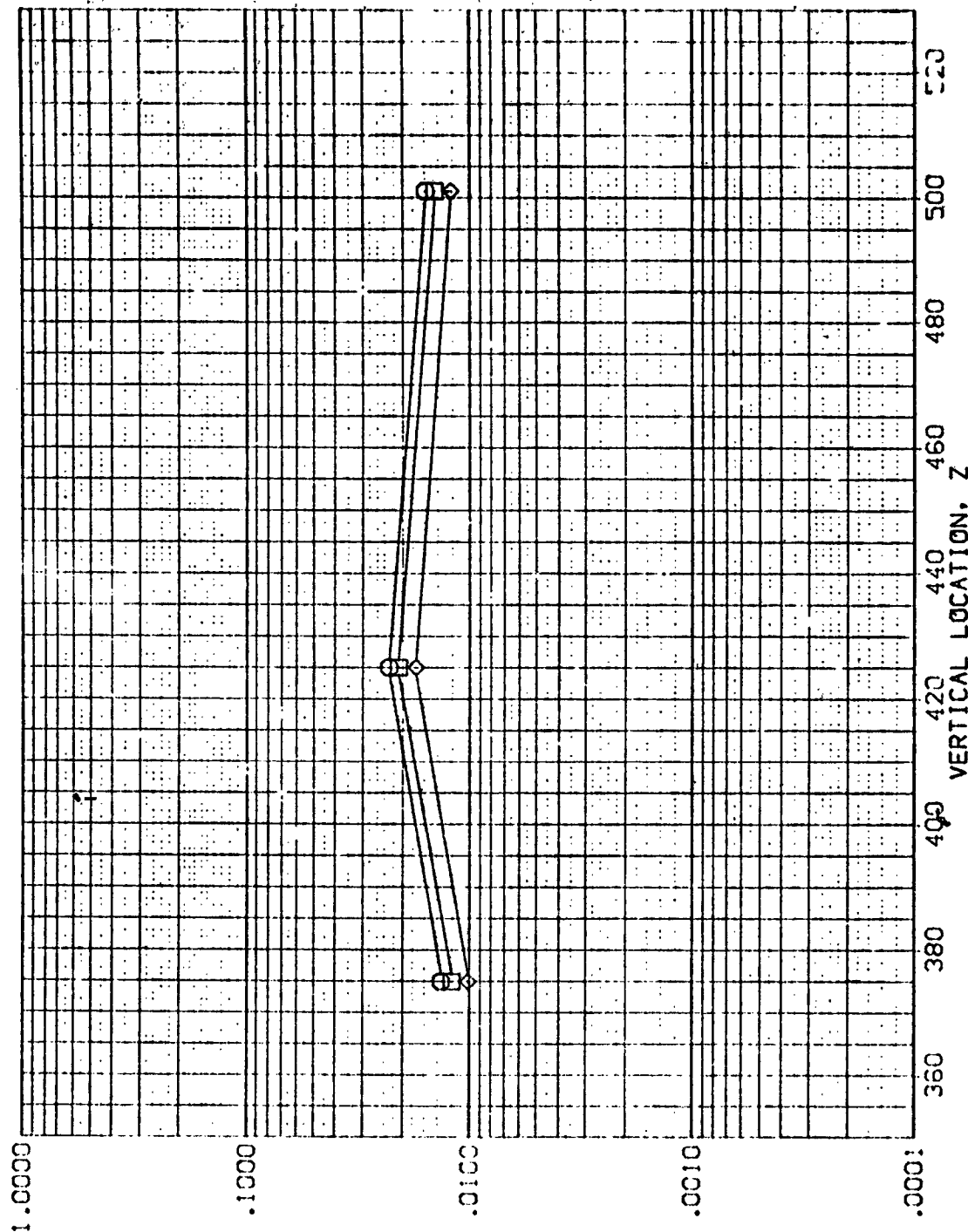


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB19)

SYMBOL  
 H/W/H  
 .850  
 .900  
 1.000

MACH  
 .600  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 .000  
 1.000  
 BETA  
 .000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

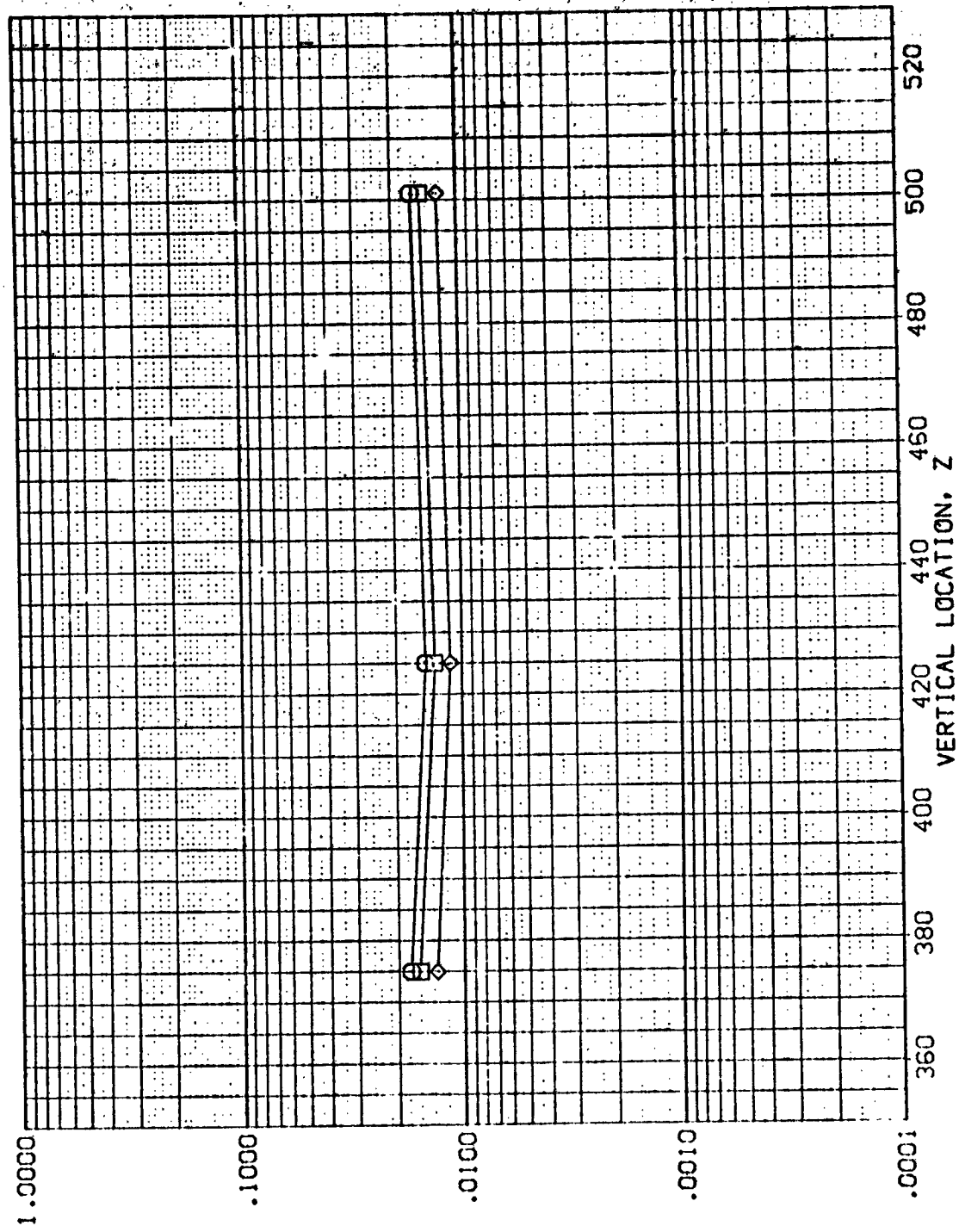


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB19)

BODY SIDEWALL

AMES 3.5-135 IH28 01

MACH  
5.220

X/L  
.700

HAW/HT  
.850

.900  
1.000

PARAMETRIC VALUES

BETA

.000  
1.000

$\alpha_{PHA}$   
R/L

.000

SYMBOL  
◇

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

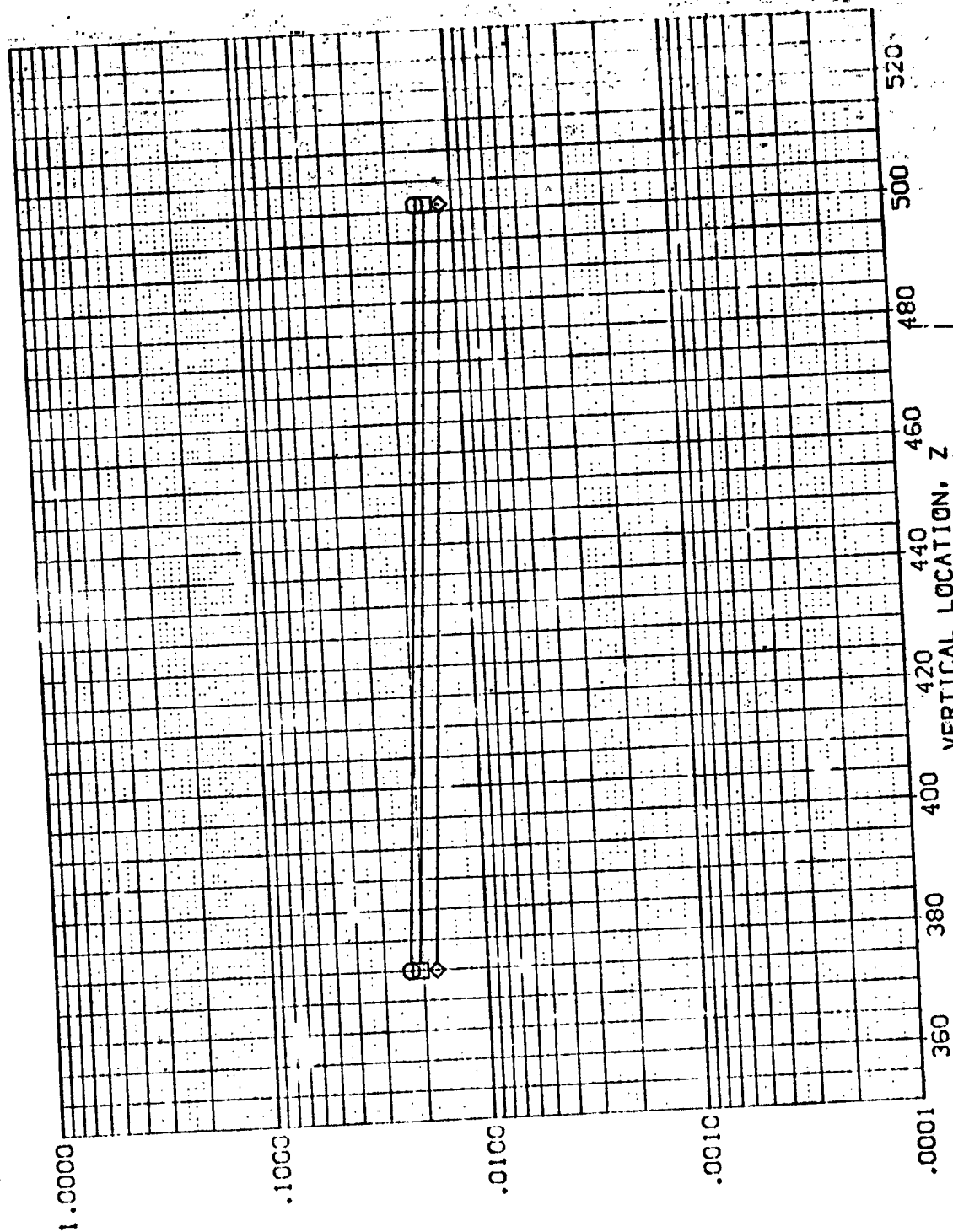


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

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ORIGINAL PAGE IS FOR

AMES 3.5-195 IH28 01 BODY SIDEWALL (REVB20)

S.W.C.	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				30,000	BETA
◇	.850	.300	5.219	ALPHA	.000
◇	.900			RV/L	1.000
◇	1.000				

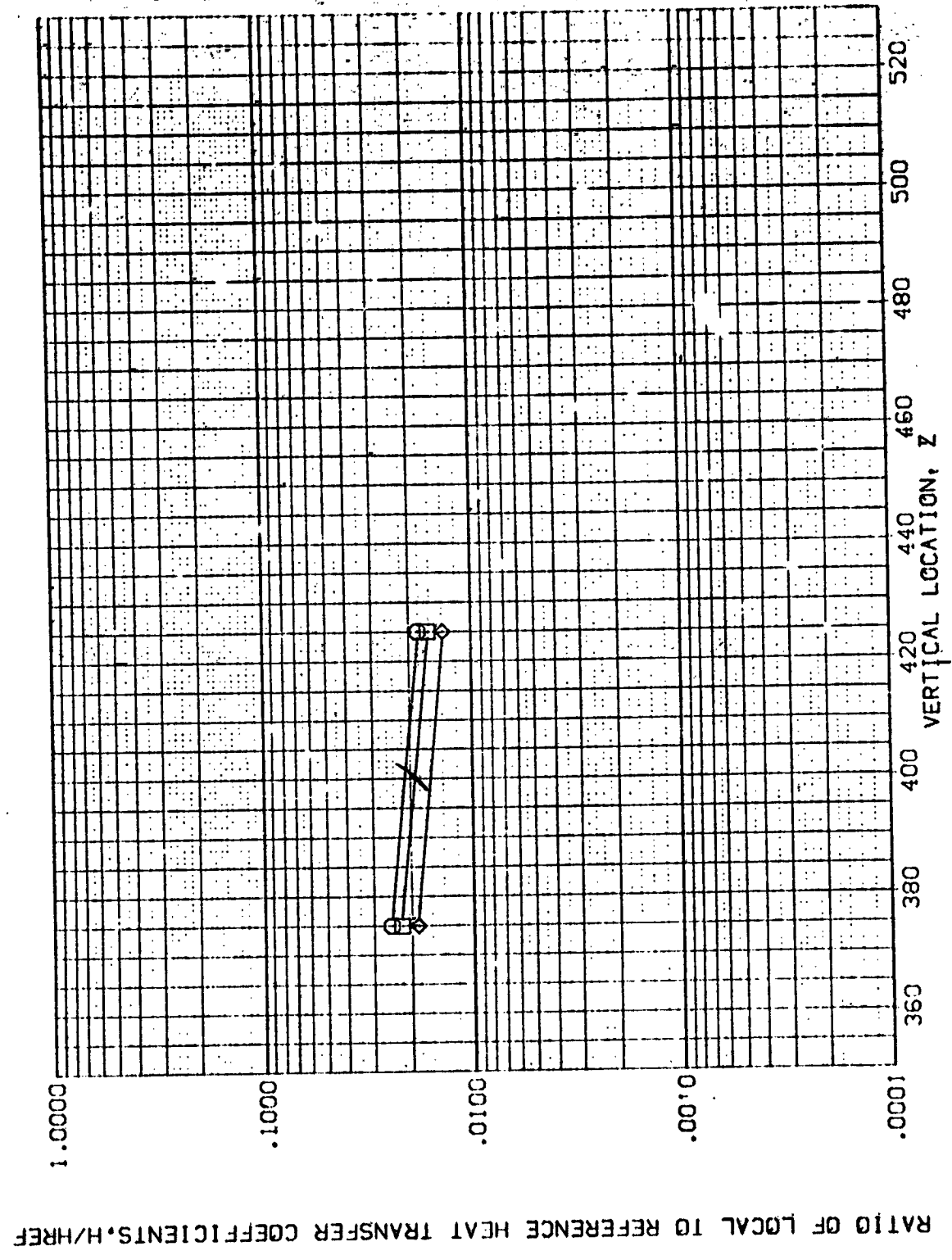


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB20)

AMES 3.5-195 IH28 01 BODY SIDEWALL

SV-BCL HAW/HT X/L MACH

.850 .400 5.219  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 3C 000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

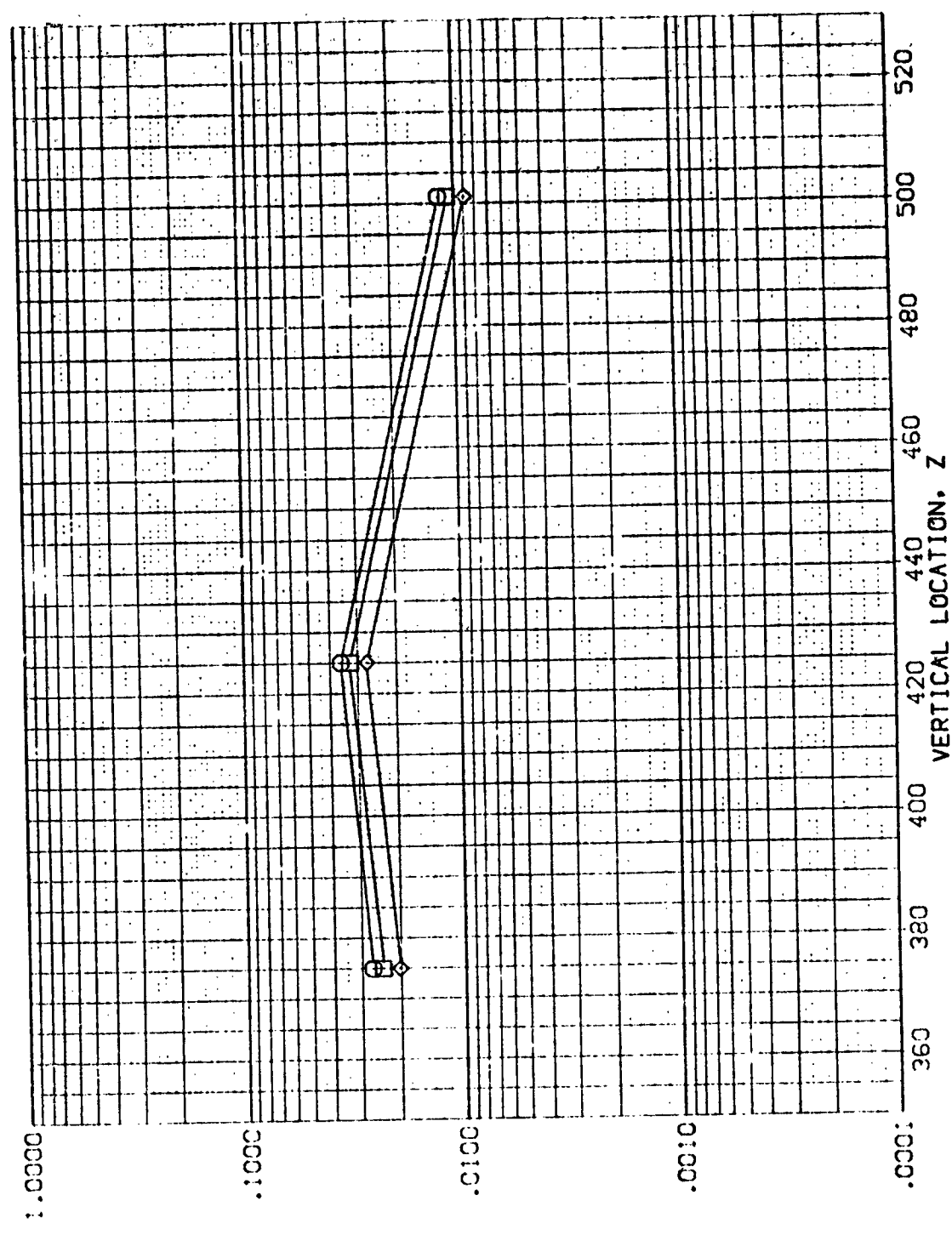


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB20)

SLIP  
GEAR  
HAW/HT  
.850  
.900  
1.000

X/L  
.500  
MACH  
5.219

PARAMETRIC VALUES  
ALPHA  
RN/L  
39.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

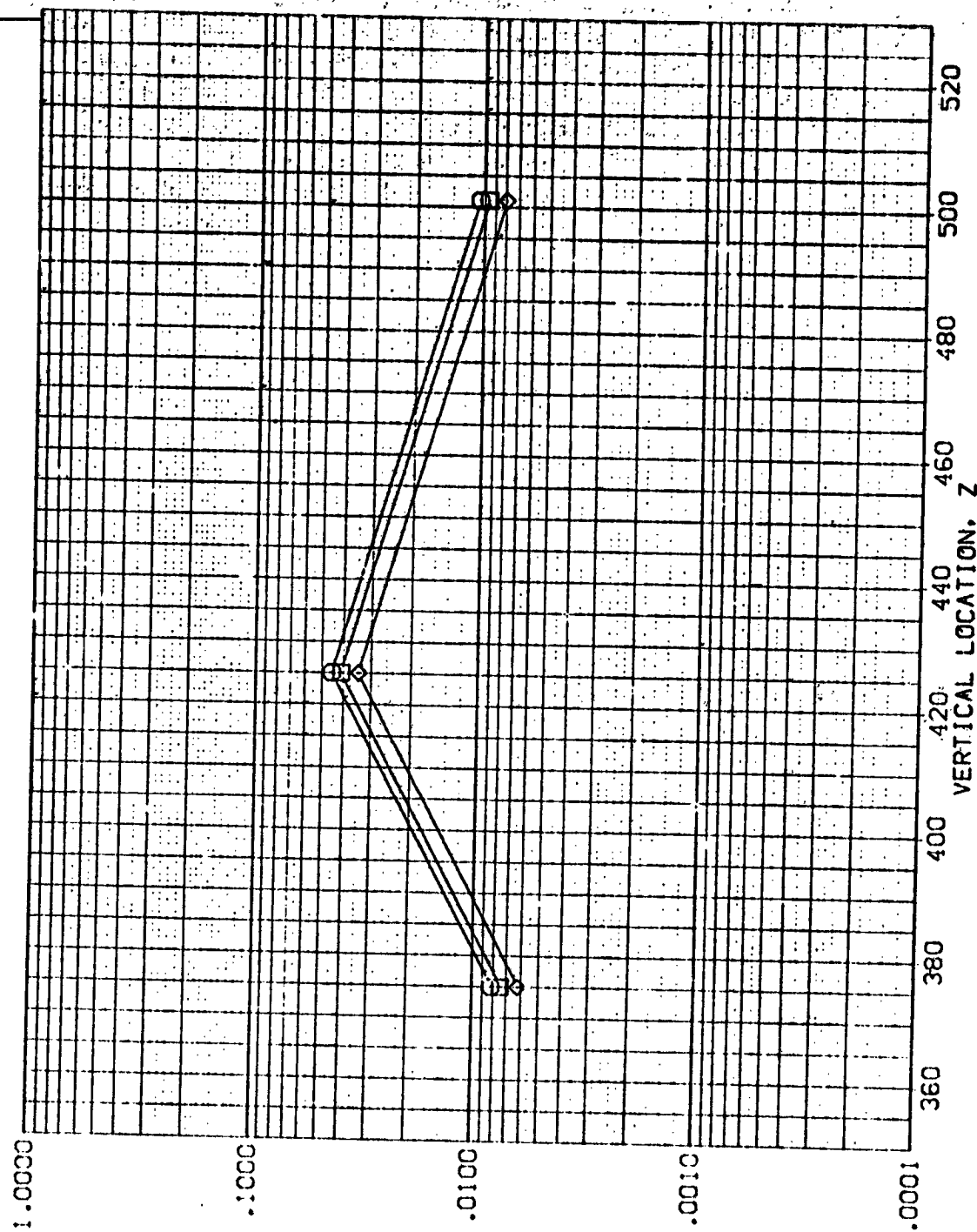


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



(REVB20)

AMES 3.5-195 IH28 01 BODY SIDEWALL

SYMBOL

MASS/HT X/L MACH  
.850 .600 5.219  
.900  
1.000

PARAMETRIC VALUES  
ALPHA 30 000 BETA .000  
RN/E 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

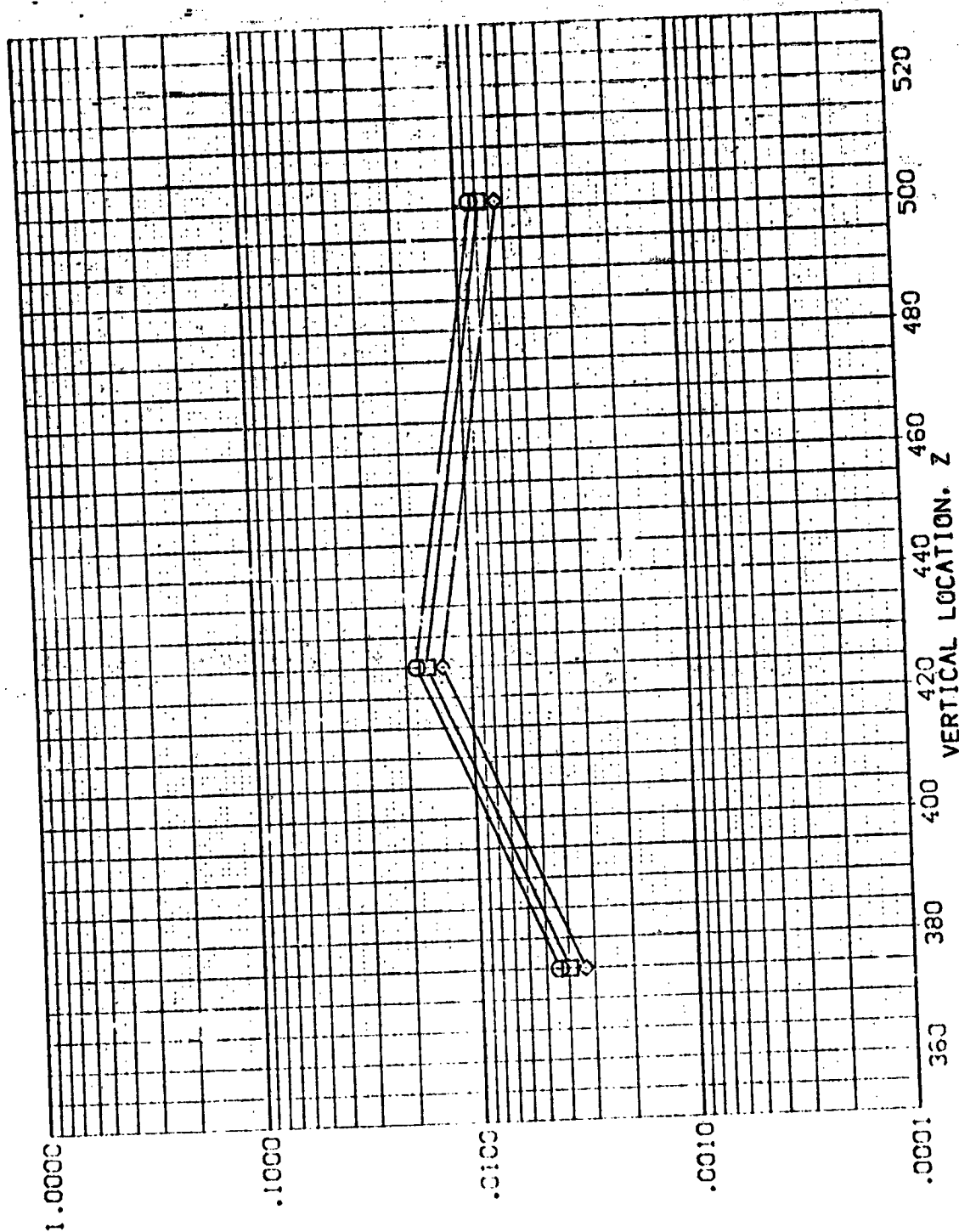


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB20)

SECT	WAVE/HT	X/L	MACH	PARAMETRIC VALUES
0100	.850	.700	5.219	ALPHA 30.000 BETA .000
	.900			RV/L 1.000
	1.000			

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

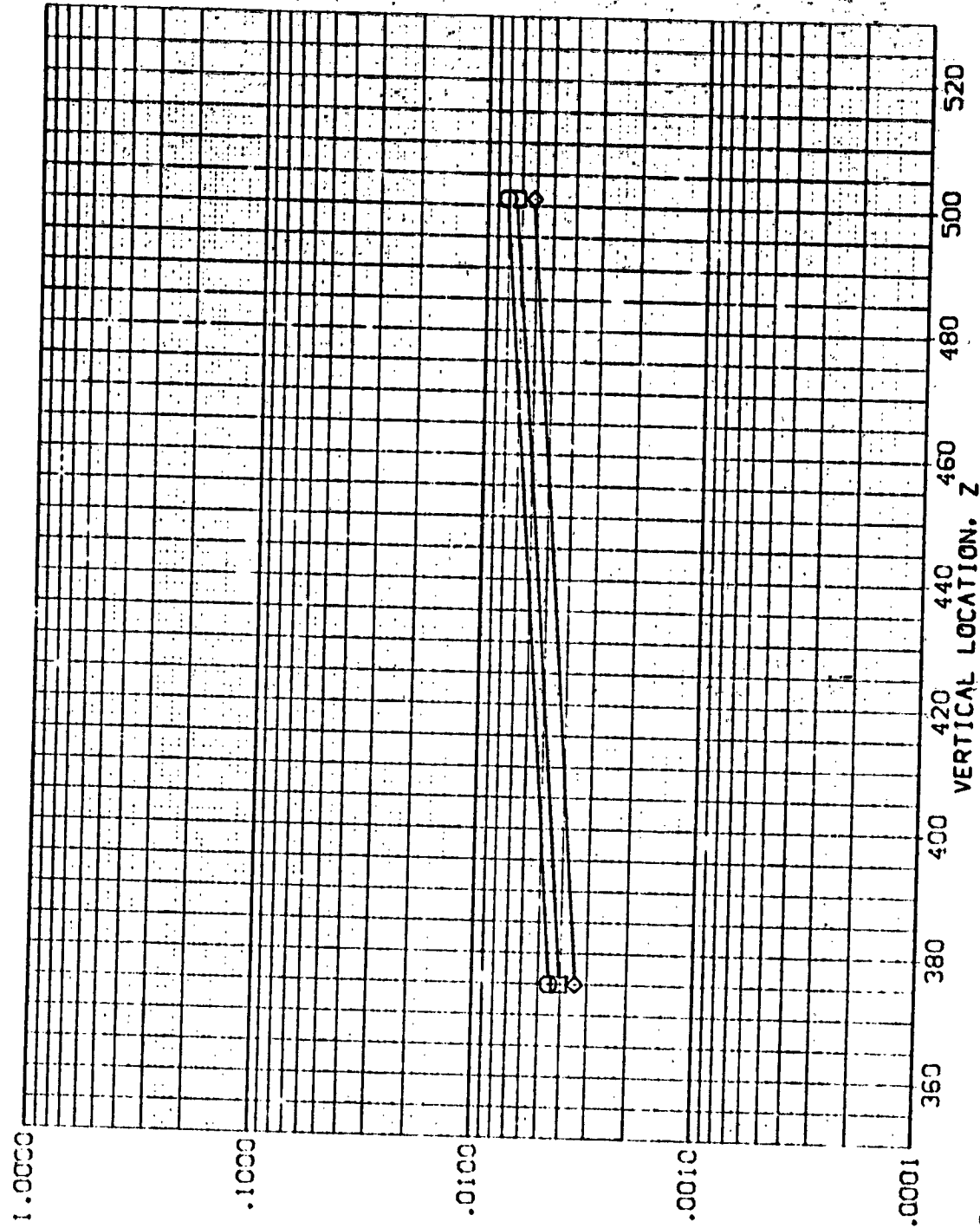


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB21)

$\diamond$  0.110  
 S-REF  
 H/W-REF  
 .850  
 .900  
 1.000

X/L  
 .300  
 MACH  
 5.220

PARAMETER VALUES  
 ALPHA 60.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

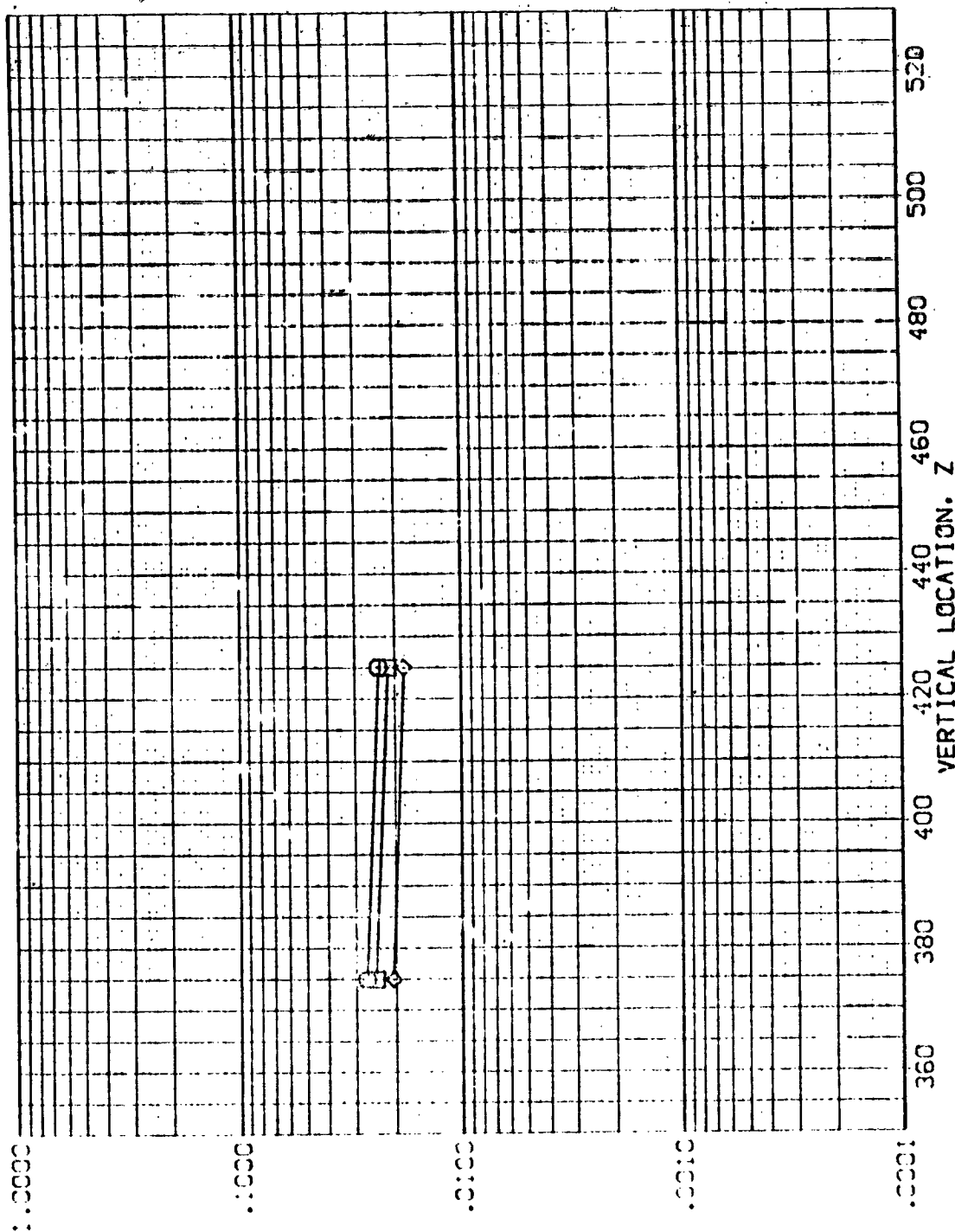


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 3.5-195 1H28 01 BODY SIDEWALL

(REVB21)

SYSC. PARAMETER X/L MACH  
 .850 .400 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 RE/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

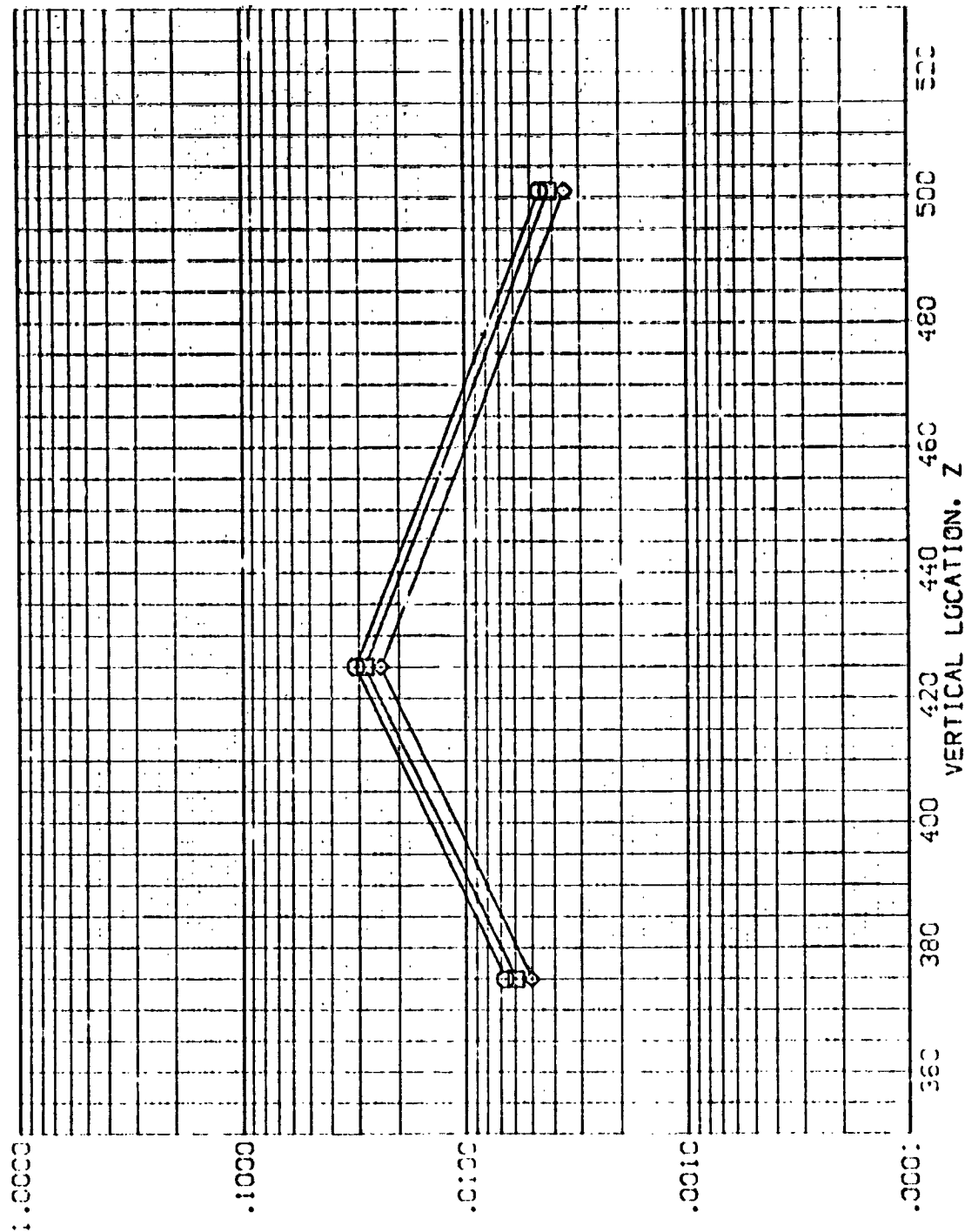


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB21)

SYMBOL  
 ◇  
 □  
 ○

MAW/HT .850  
 .900  
 1.000

X/L .500

MACH 5.226

PARAMETRIC VALUES  
 ALPHA 60.000  
 RN/L 1.000

BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

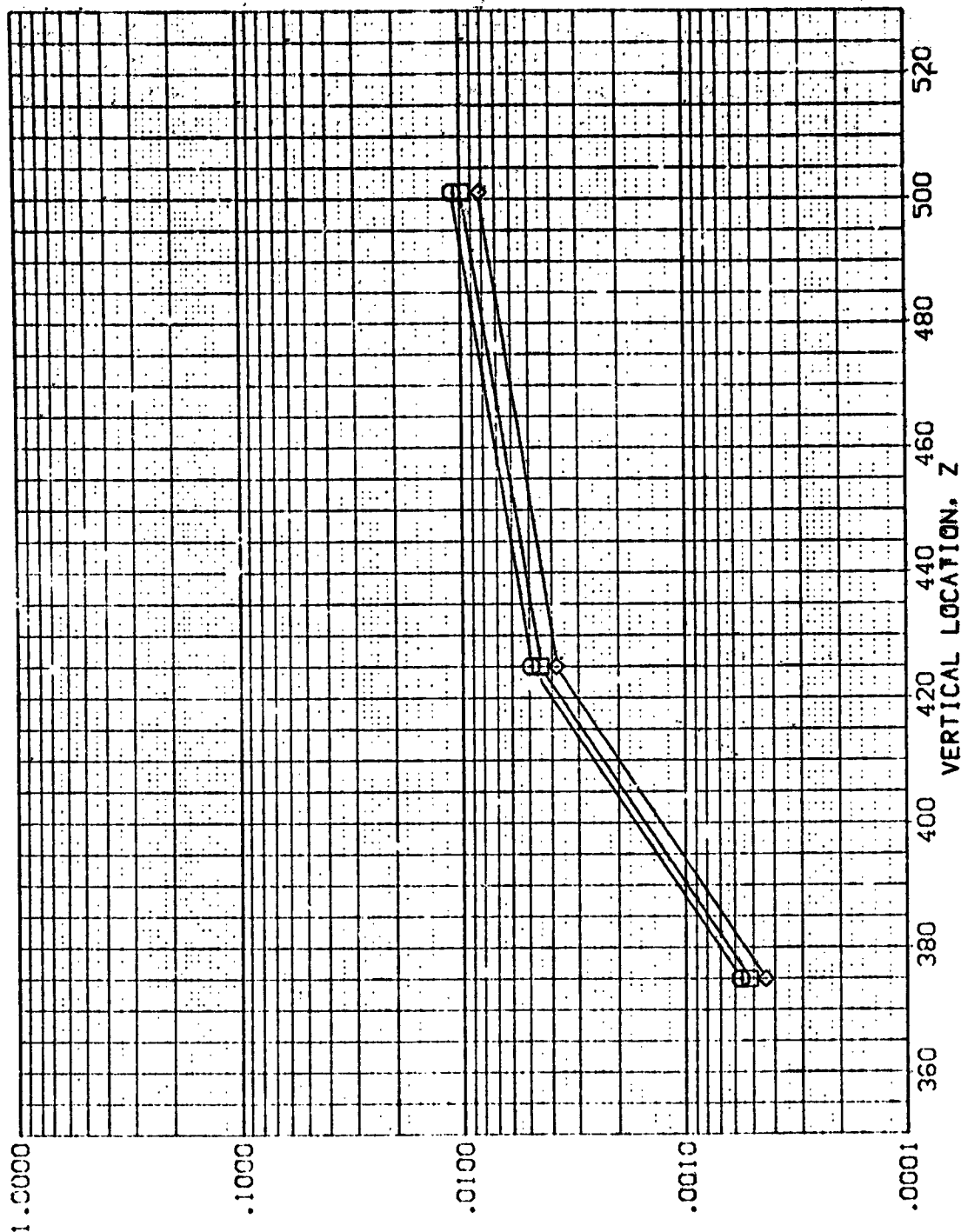


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REV B21)

SYMBOL  $\diamond$   $\square$   $\circ$

HAY/HT .850  
X/L .600  
MACH 5.220  
1.000

PARAMETRIC VALUES  
ALPHA 60.000  
RN/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

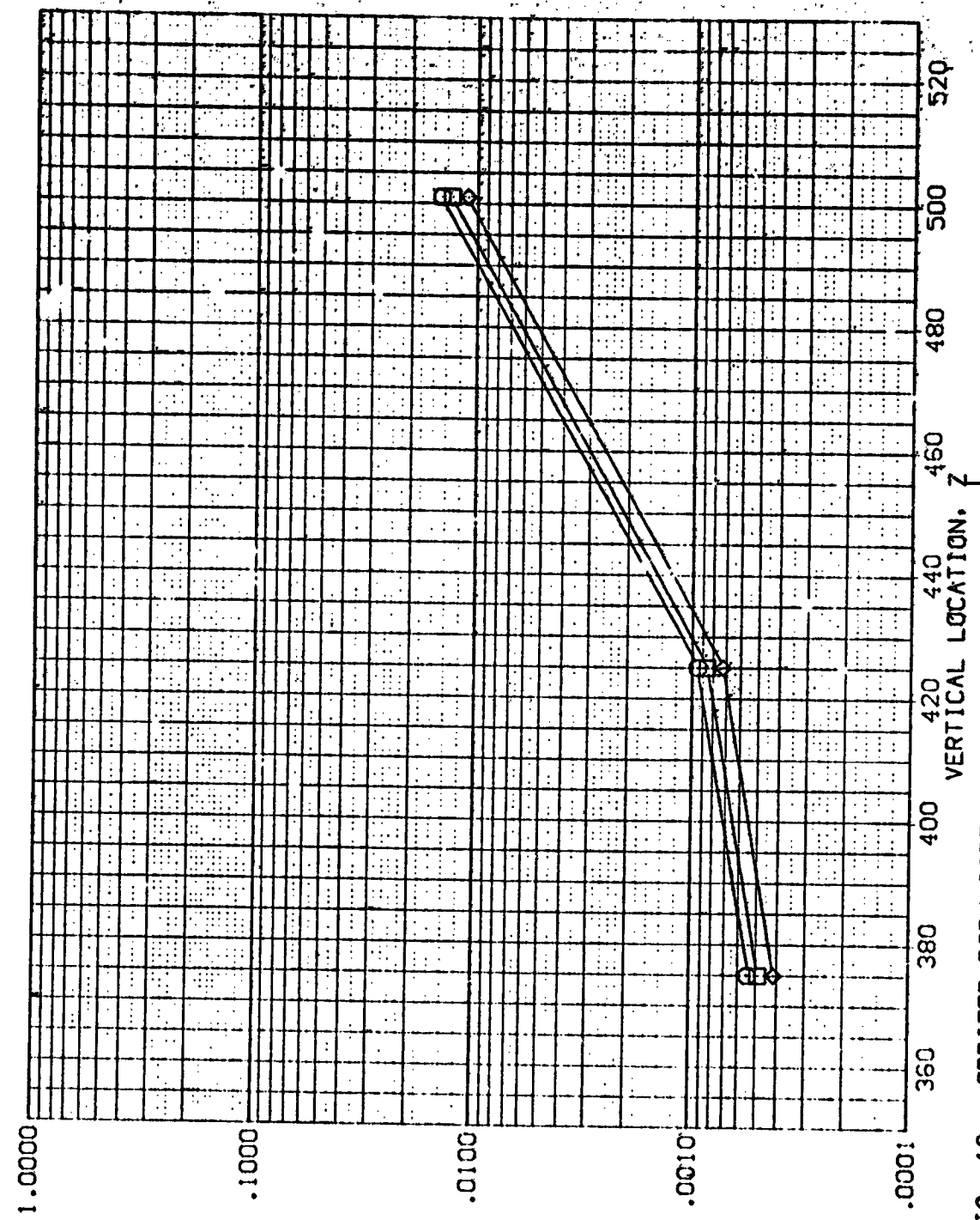


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB21)

SYMBOL

HAW/HT  
.850  
.900  
1.000

X/L  
.700  
5.220

MACH

PARAMETRIC VALUES  
ALPHA  
RN/L  
CC 300  
BETA  
1.000  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

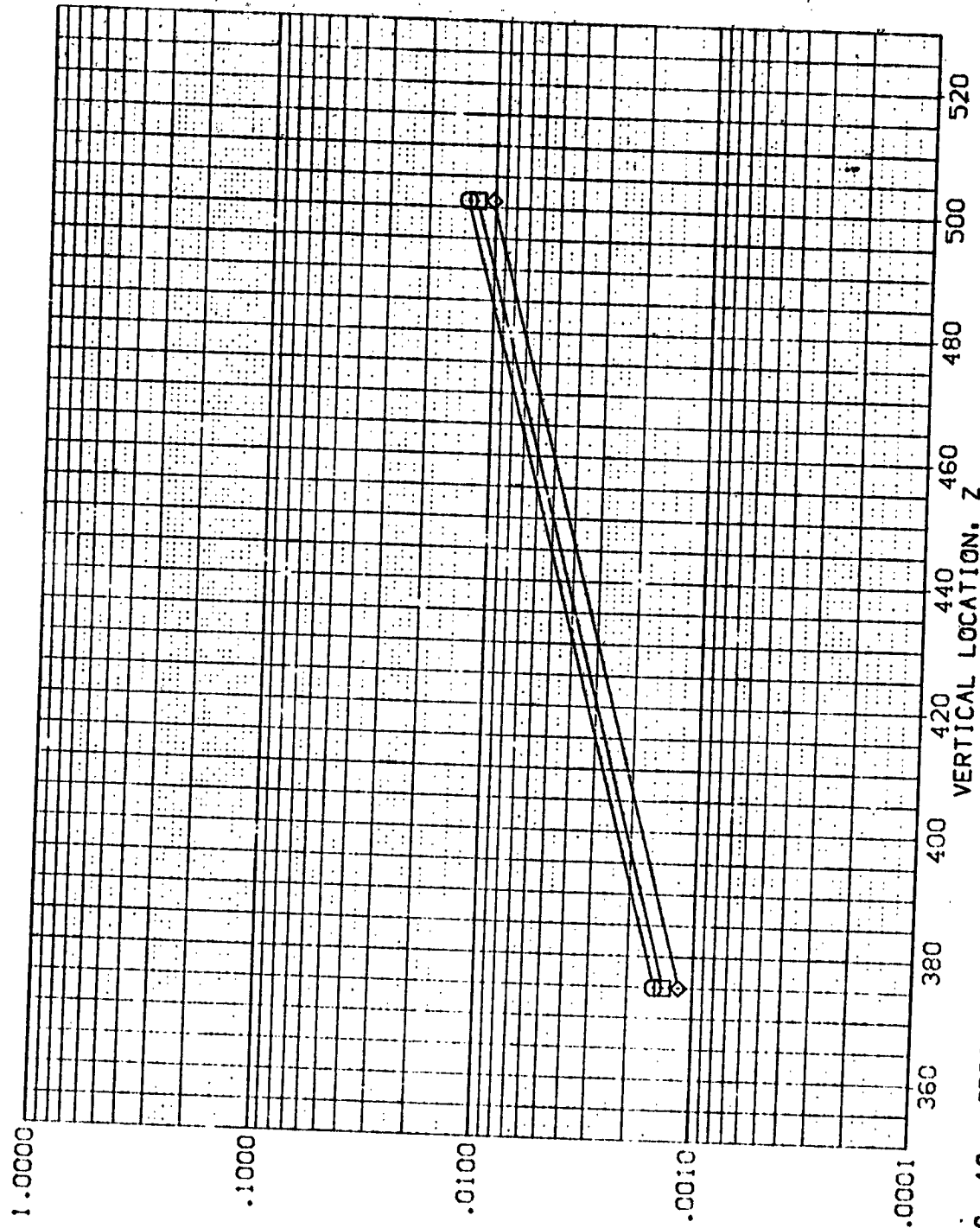


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01

06-0000

**RN/L**

## 5.220

300.

33

○

**Figure 1**

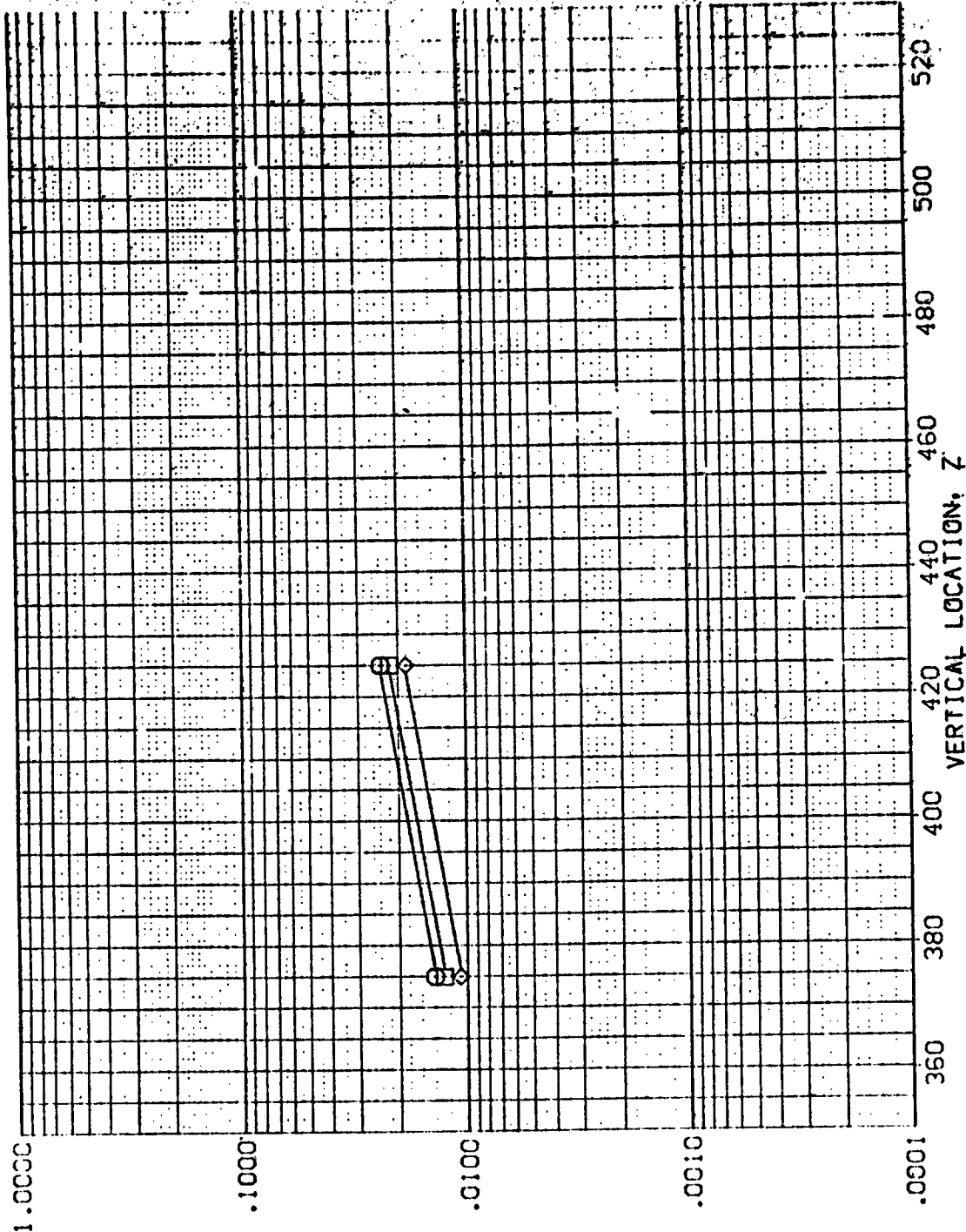


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB22)

SYMBOL

HAIR/HT .850  
X/L .400  
MACH 5.220

PARAMETRIC VALUES  
ALPHA 9C 200  
RH/L 1.000 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

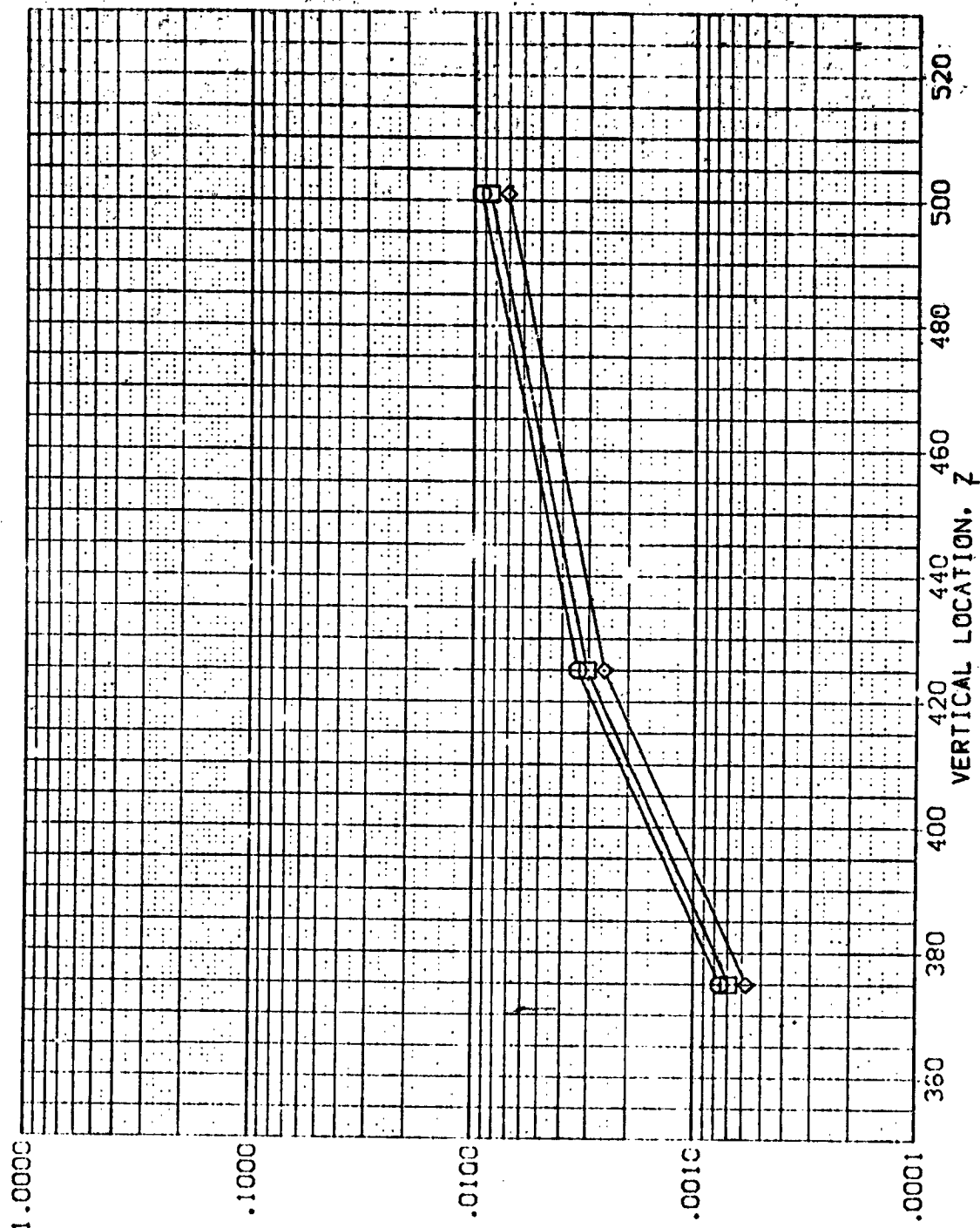


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB22)

SYMBOL	HAW/H <sup>+</sup>	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA
◇	.850	.500	5.220	90.000	.0000
□	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

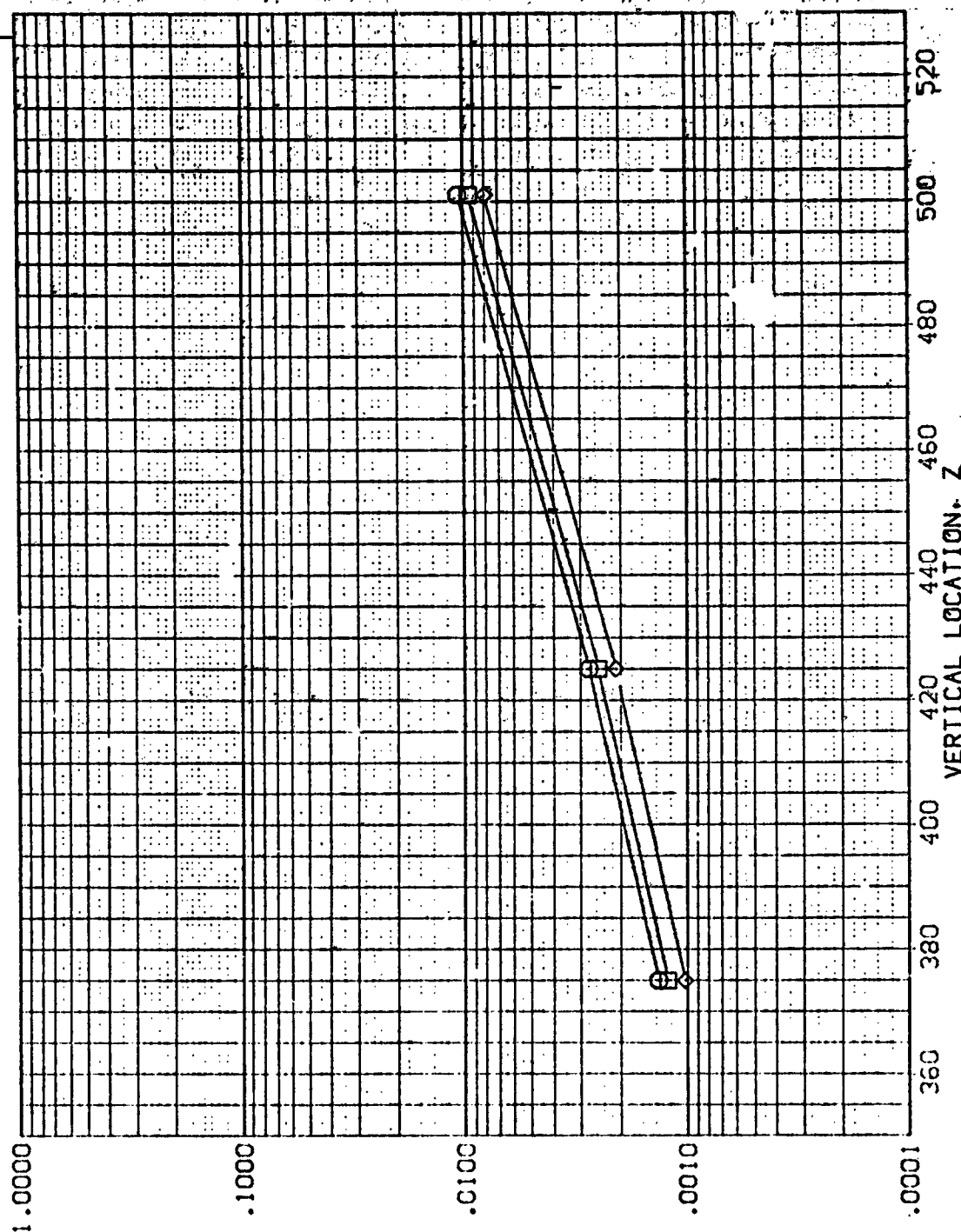


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB22)

SYMBOL  $\diamond$   $\square$   $\square$

HAN/HT .850  
X/L .600  
MACH 5.220  
1.000

PARAMETRIC VALUES  
ALPHA 90.000  
RN/L 1.000  
BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

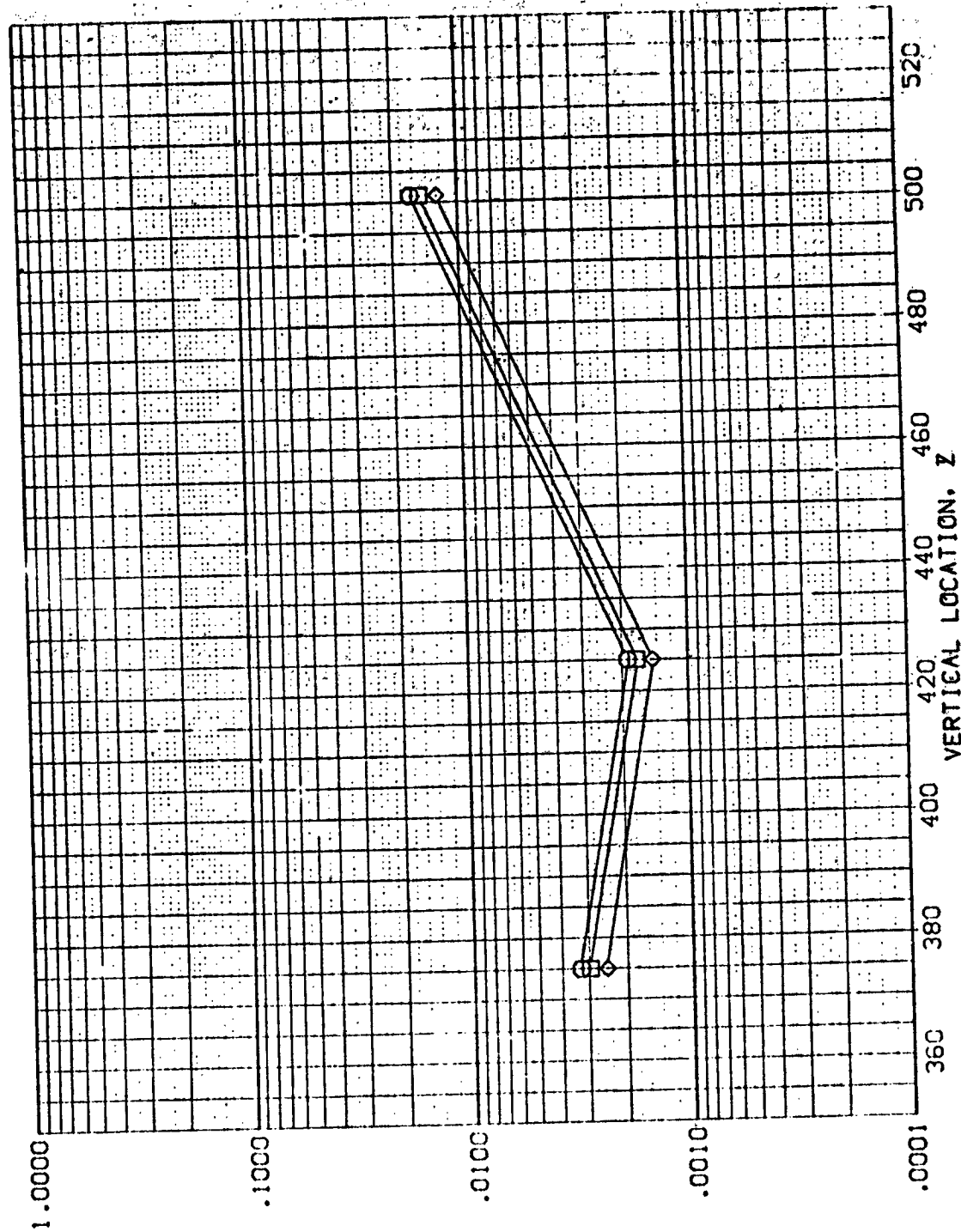


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB22)

SYMBOL  $\diamond$   $\square$

HAN/HT .850  
.930  
1.000

X/L .700

MACH 5.220

PARAMETRIC VALUES  
ALPHA 90.000  
BETA 1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

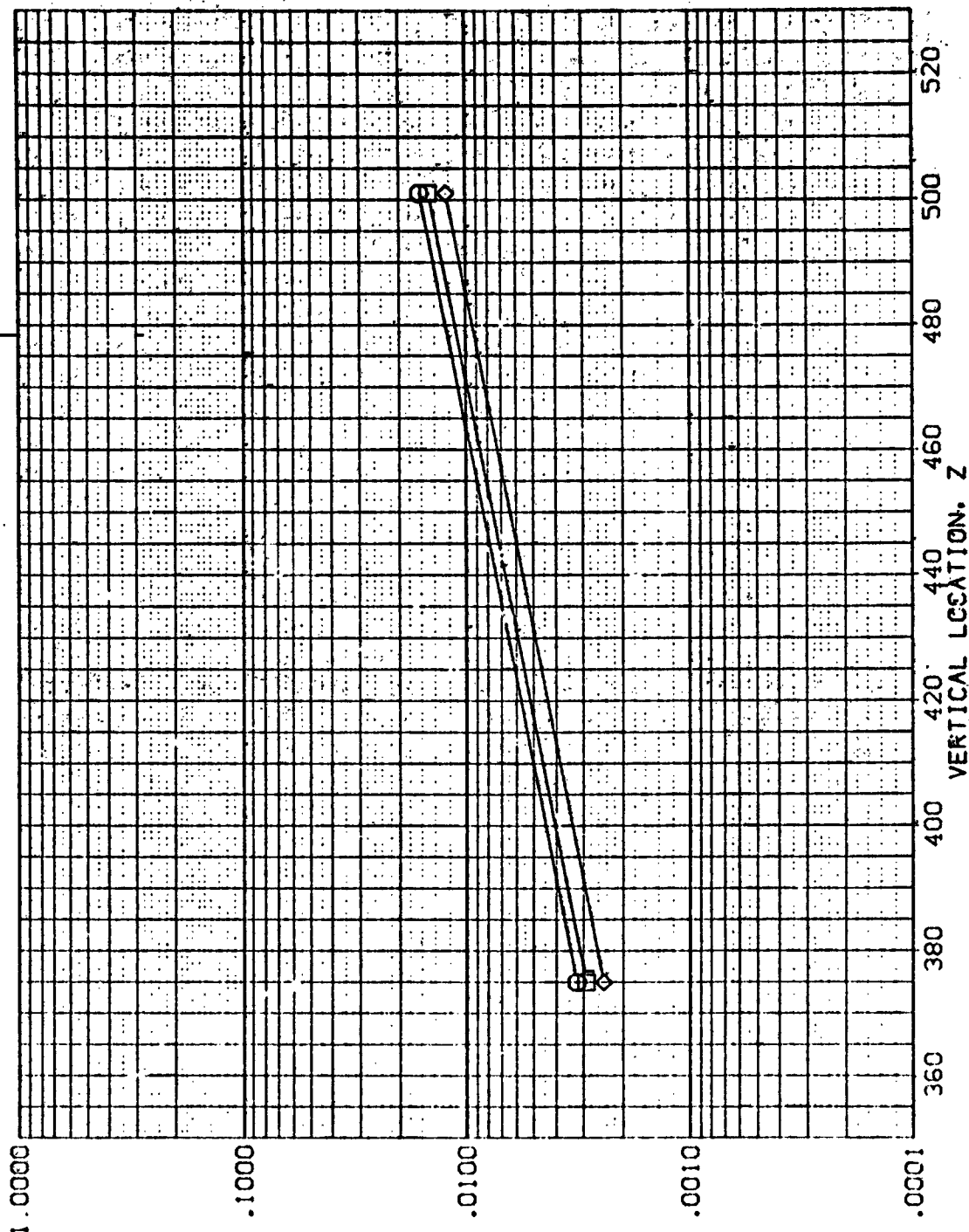


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB23)

SYMBOL

HA/W/HT  
.850  
.900  
1.000

X/L  
.300

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
120.000

BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

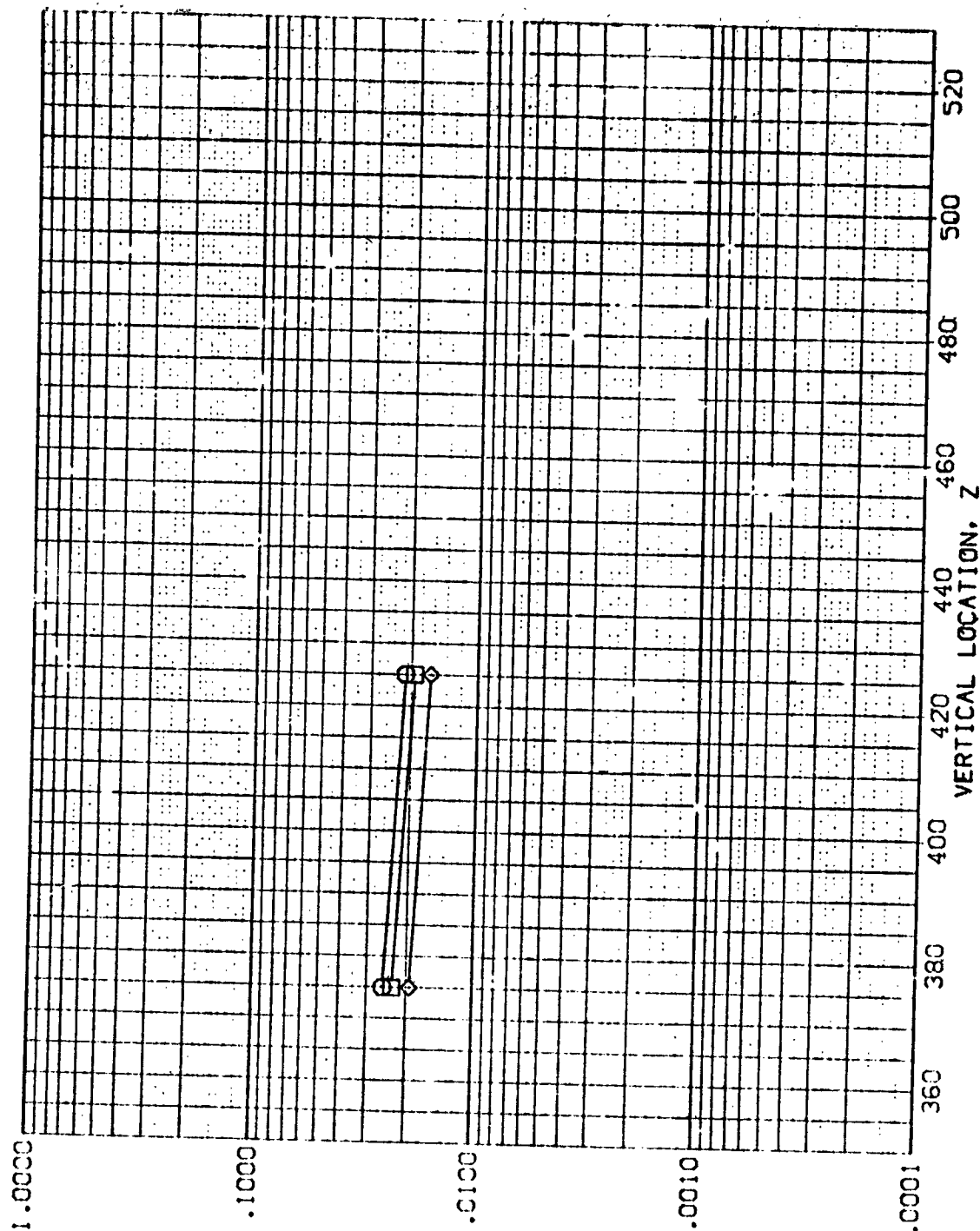


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB23)

SYMBOL  
 □  
 ○  
 ◇

HAZARD X/L MACH  
 .850 .400 5.720  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 120.000 BETA  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

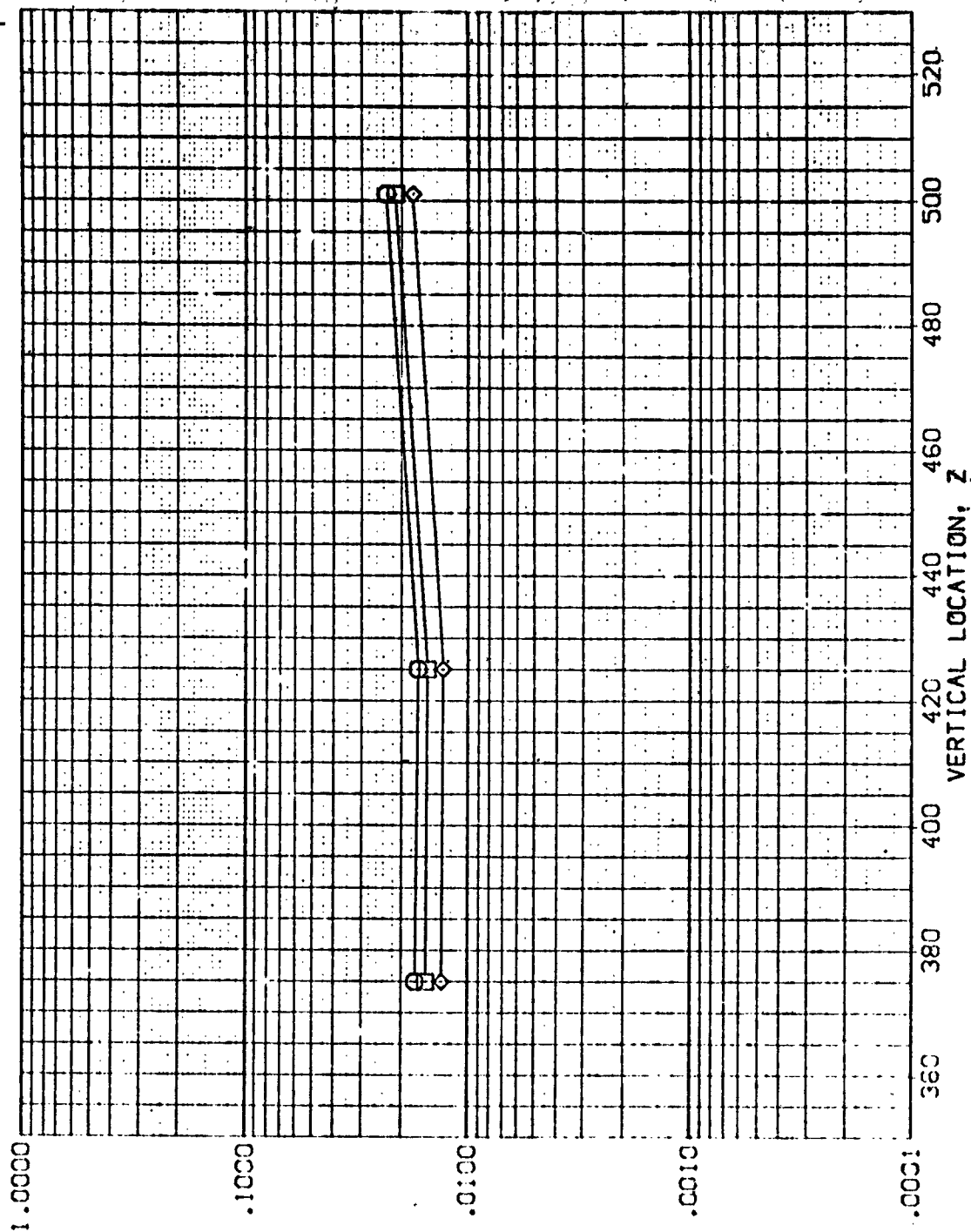


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB23)

AMES 3.5-195 IH28 01 BODY SIDEWALL

SYMBOL  
□  
◇

MAW/HT X/L MACH  
.850 .500 5.220  
.900  
1.000

PARAMETRIC VALUES  
120.000 BETA .000  
RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

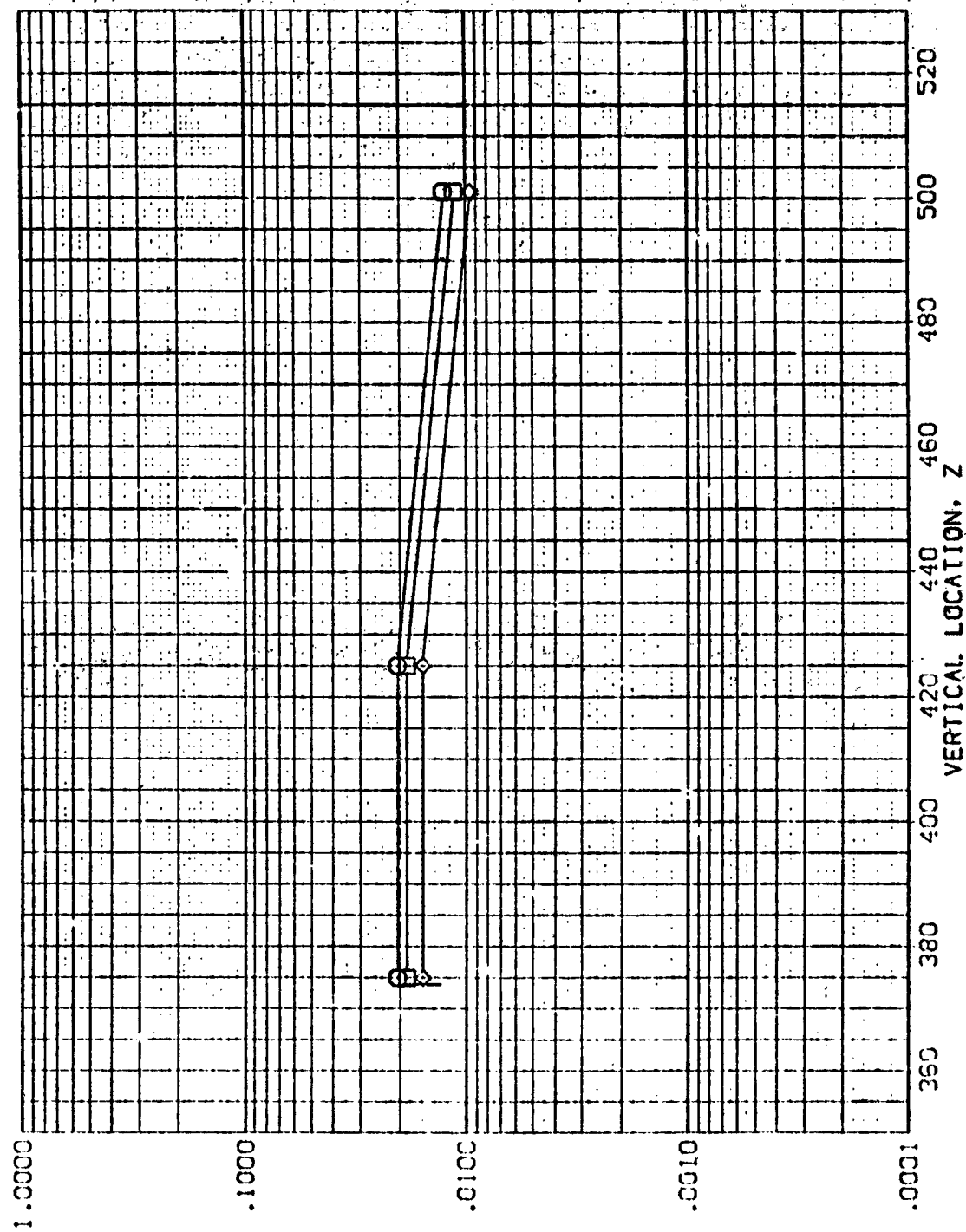


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB23)

PARAMETRIC VALUES  
ALPHA 120.000 BETA .000  
RN/L 1.000

SP/SEC HAW/HT X/L VACH  
.850 .600 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

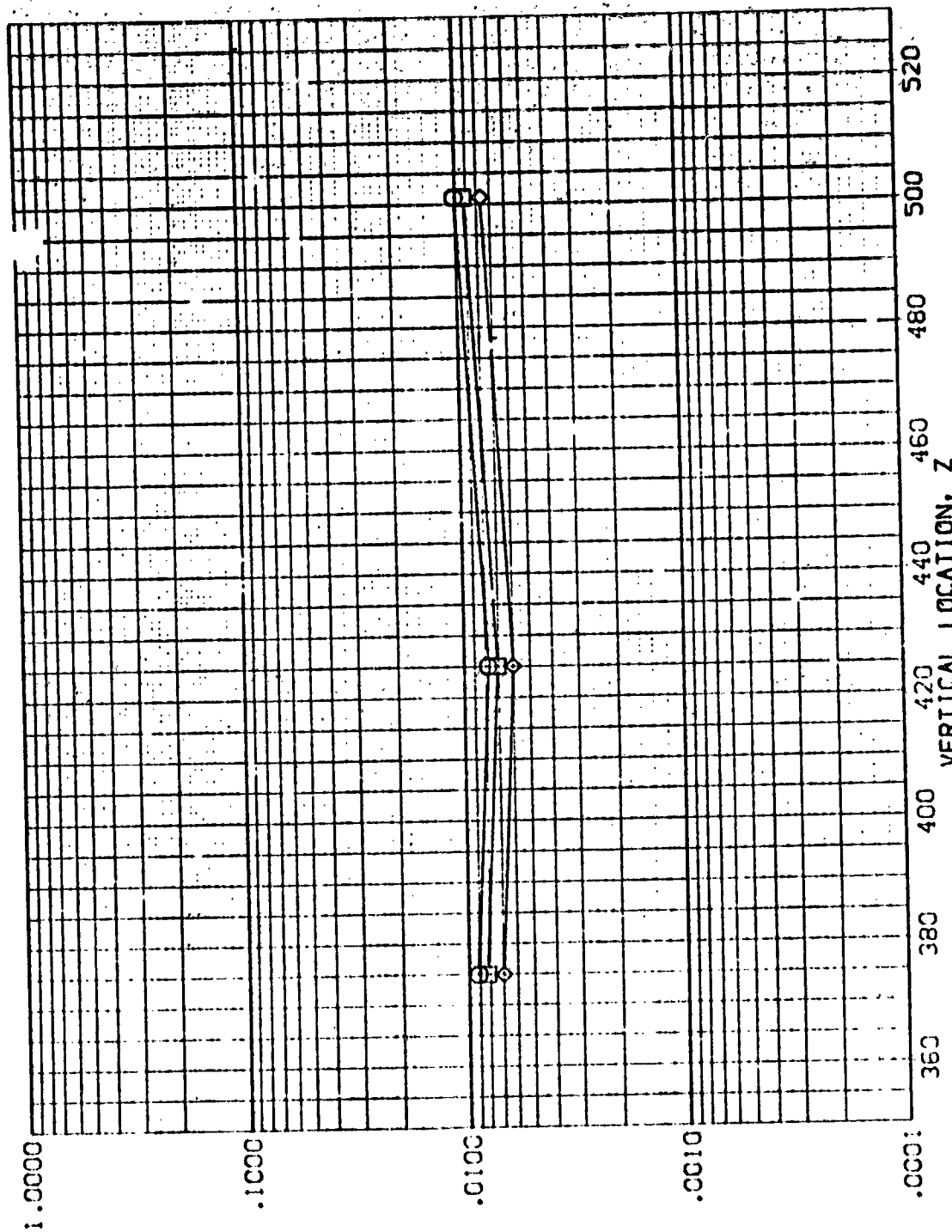


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AXES 3.5-195 IH28 01 BODY SIDEWALL

(REV923)

SYNCH

MASS/F<sup>2</sup> X/L MACH  
 .850 .700 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

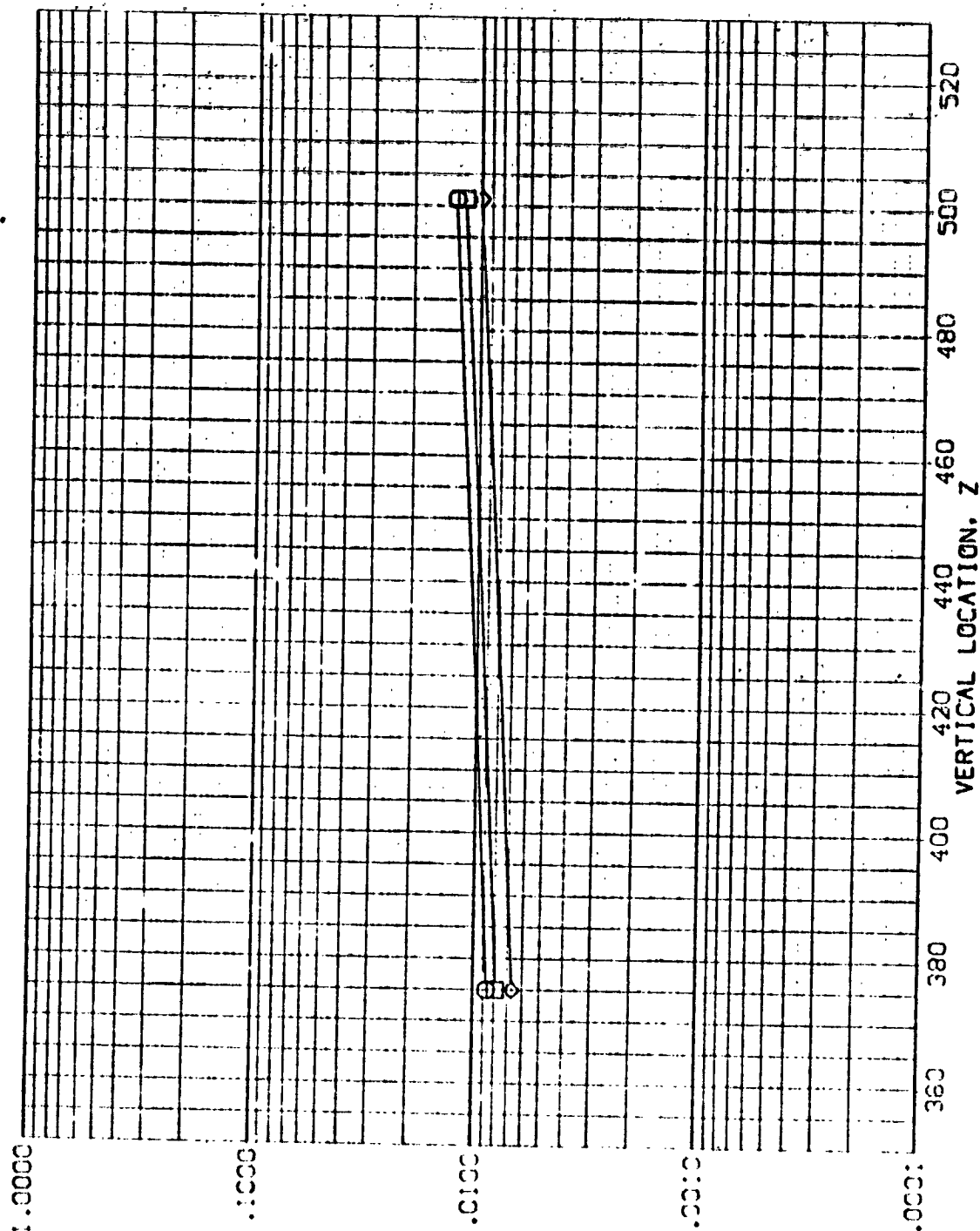


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 3.5-195 1428 01 BODY SIDEWALL

(REV824)

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RV/L 1.000

SYMBOL AVE/IN V/L MACH  
 □ .850 .300 5.220  
 ○ .900  
 ◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

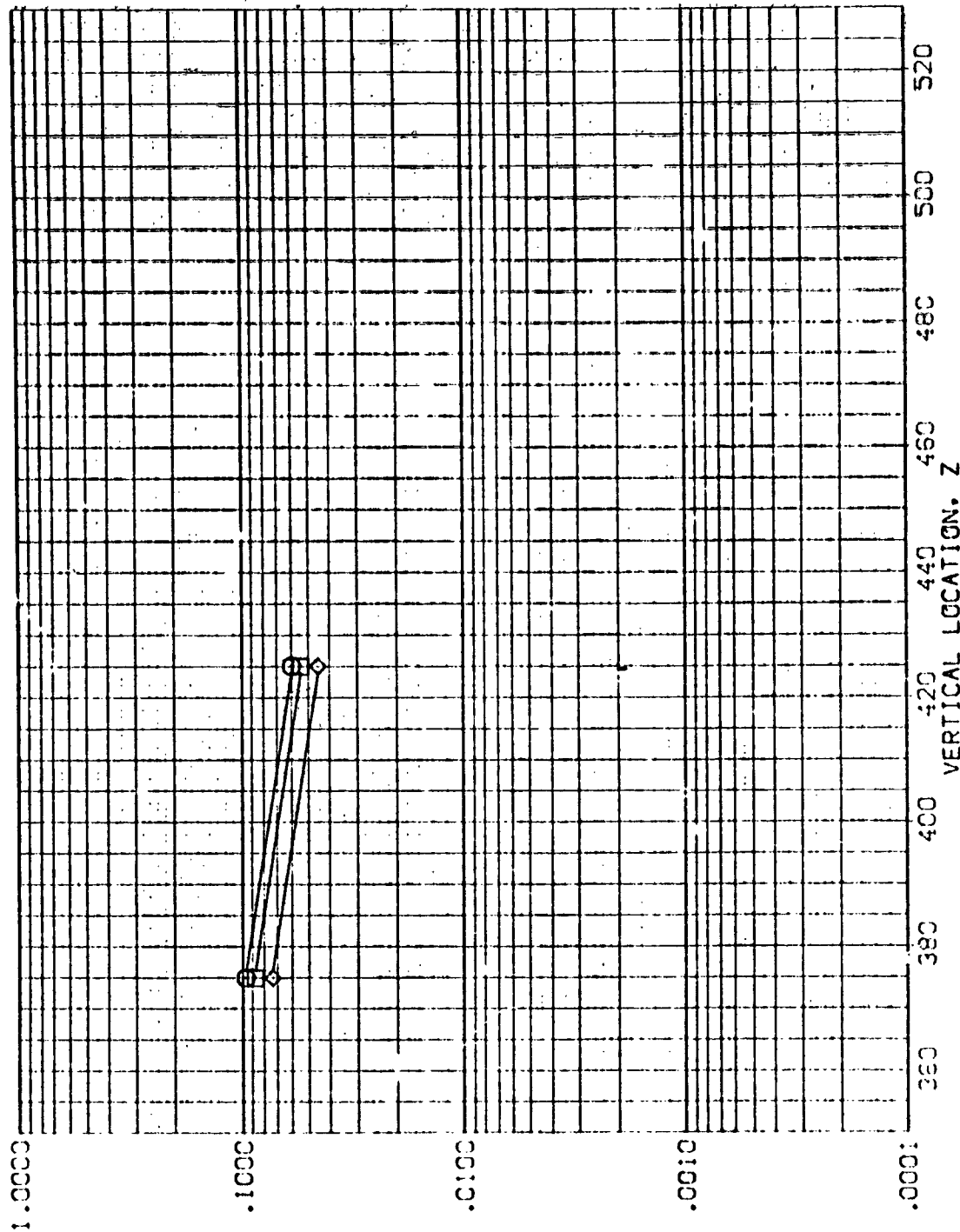


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

SYMBOL	<div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px; border-radius: 50%;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px; border-radius: 50%; transform: rotate(45deg);"></div>	HAU/HT	X/L	MACH	PARAMETRIC VALUES	
		.850	.400	5.220	ALPHA	BETA
		.900			RN/L	
1.000				-120.000	1.000	
					.000	

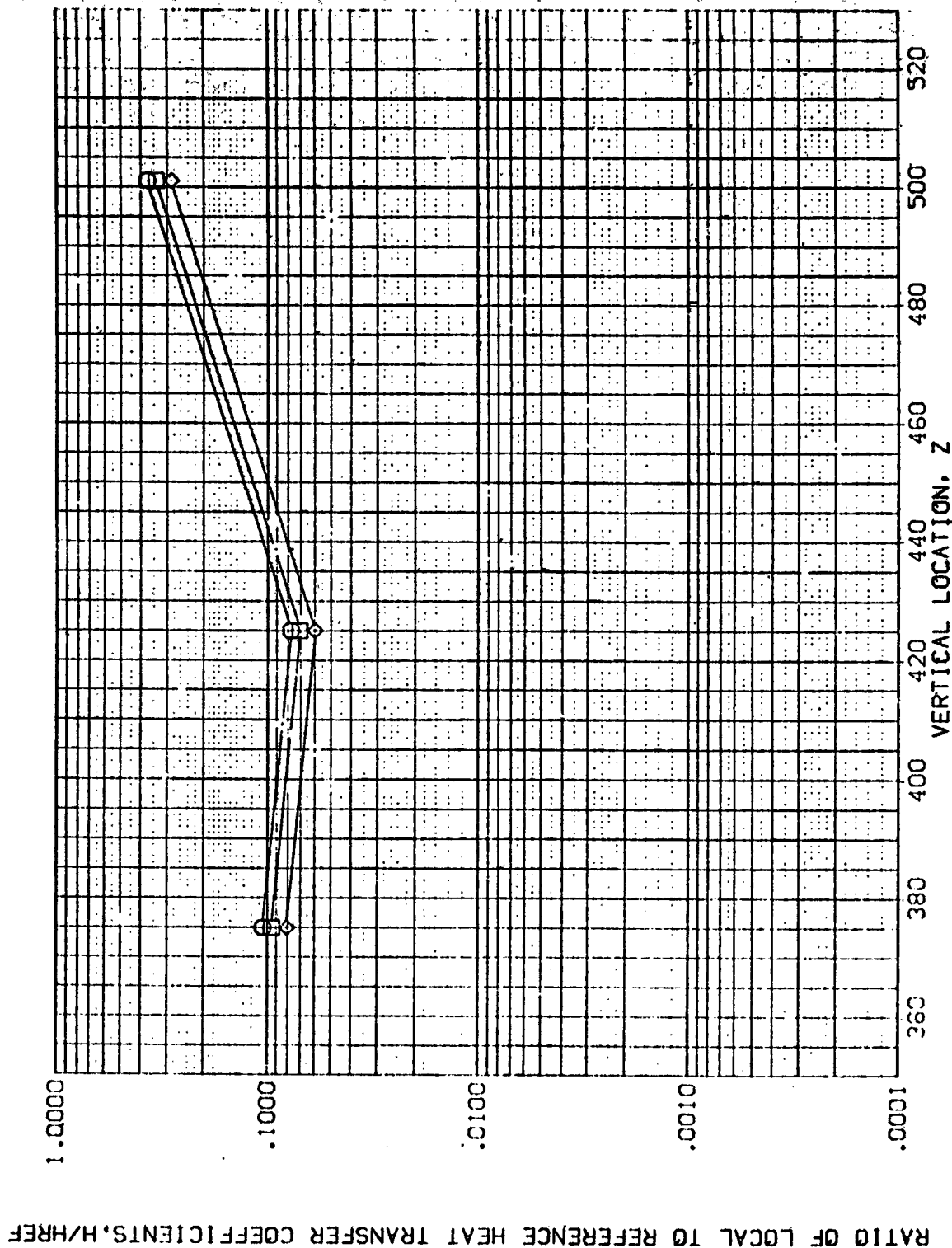


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL.

(REVB24)

SYMBOL

HAW/HT  
 .850  
 .900  
 1.000

X/L  
 .500

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -120 .080  
 BETA  
 1.000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

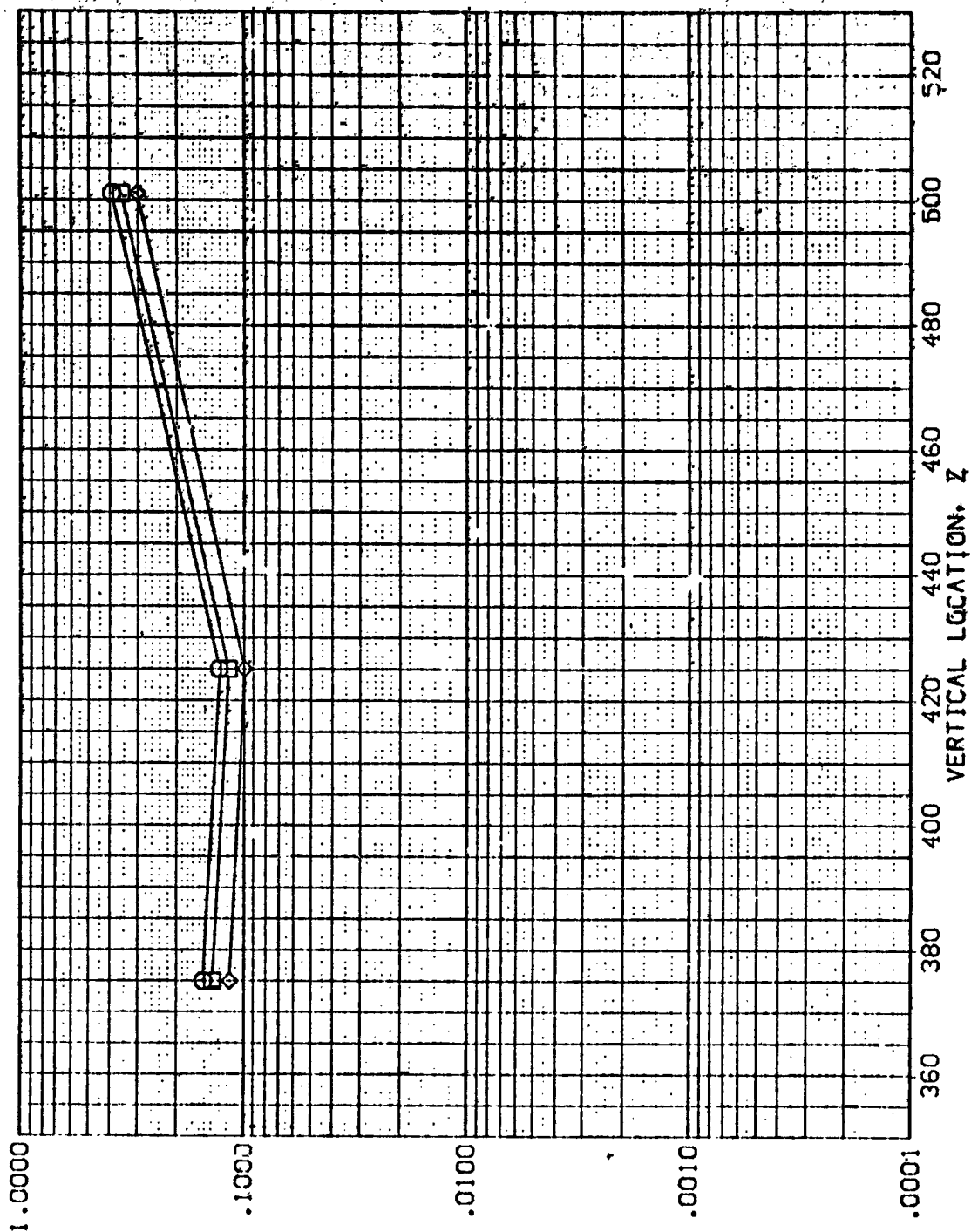


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB24)

SYNCH-  
HAW/HT  
.850  
.900  
1.000

X/L .600 MACH 5.220

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

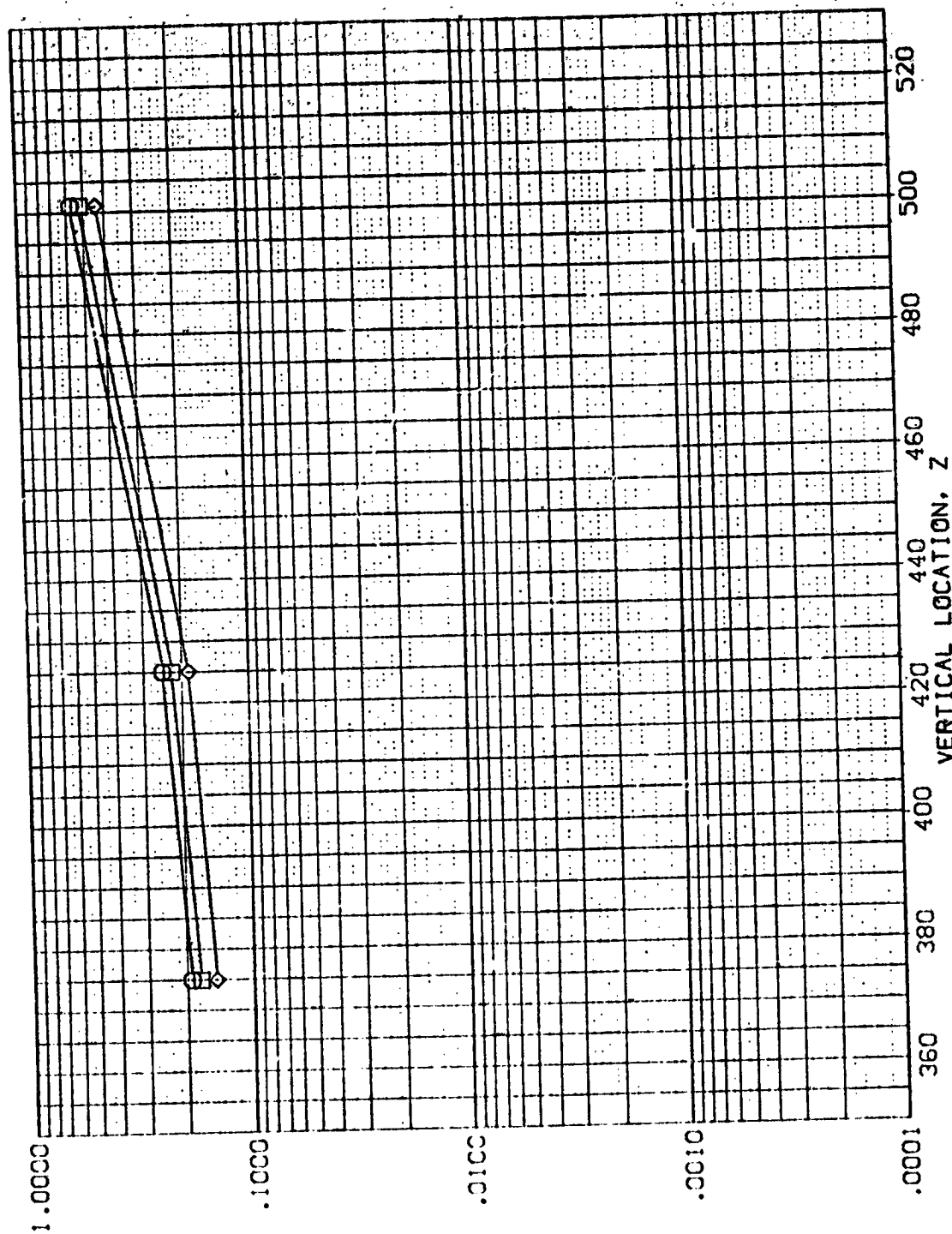


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB24)

SYMBOL  
 □  
 ◇

MAN/HT X/L MACH  
 .850 .700 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

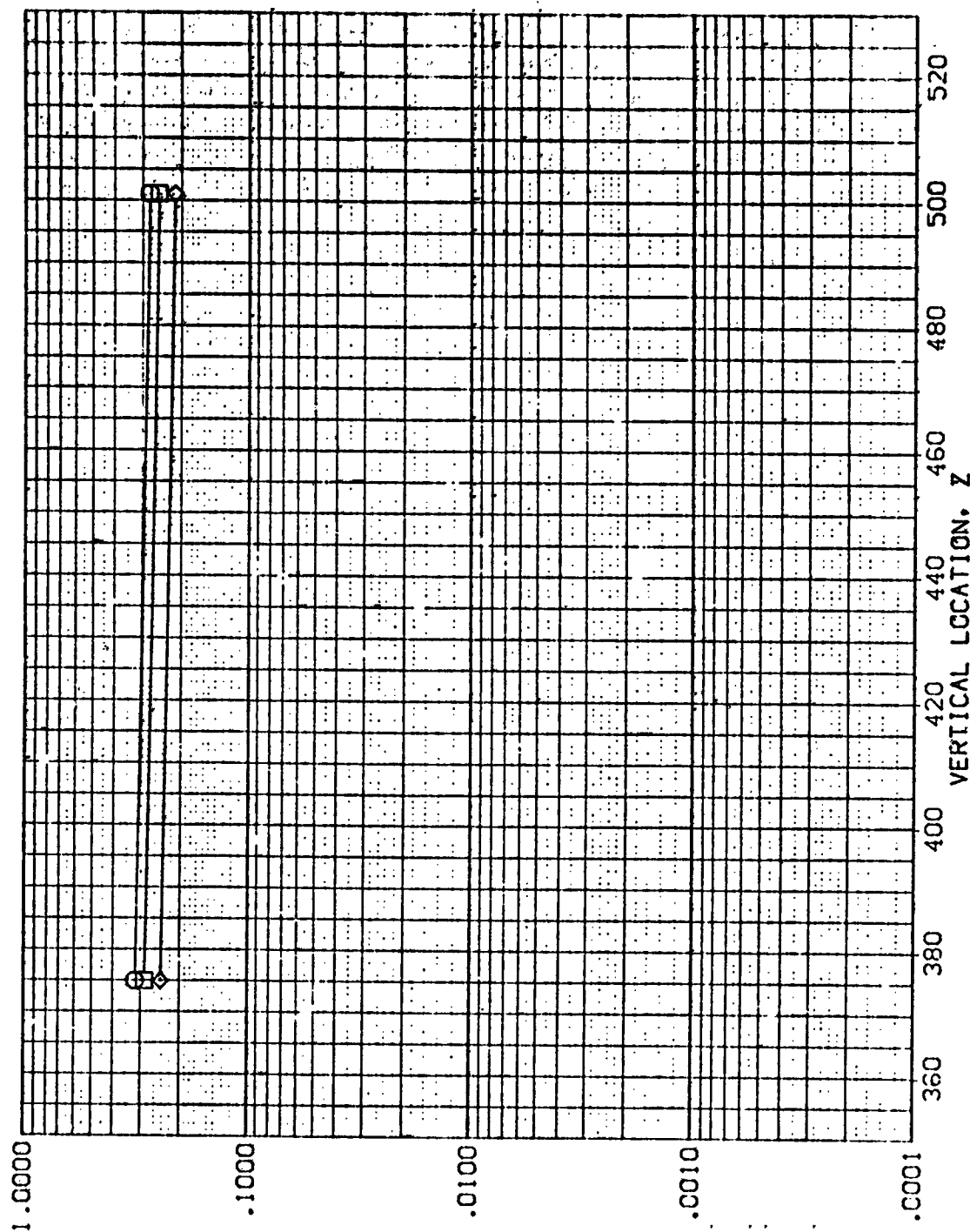


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL (REVB25)

SYMBOL  
 $\diamond$   
 $\square$

HAW/HT .85C  
 .900  
 1.000

X/L .300

MACH 5.219

PARAMETRIC VALUES  
 ALPHA -90.000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

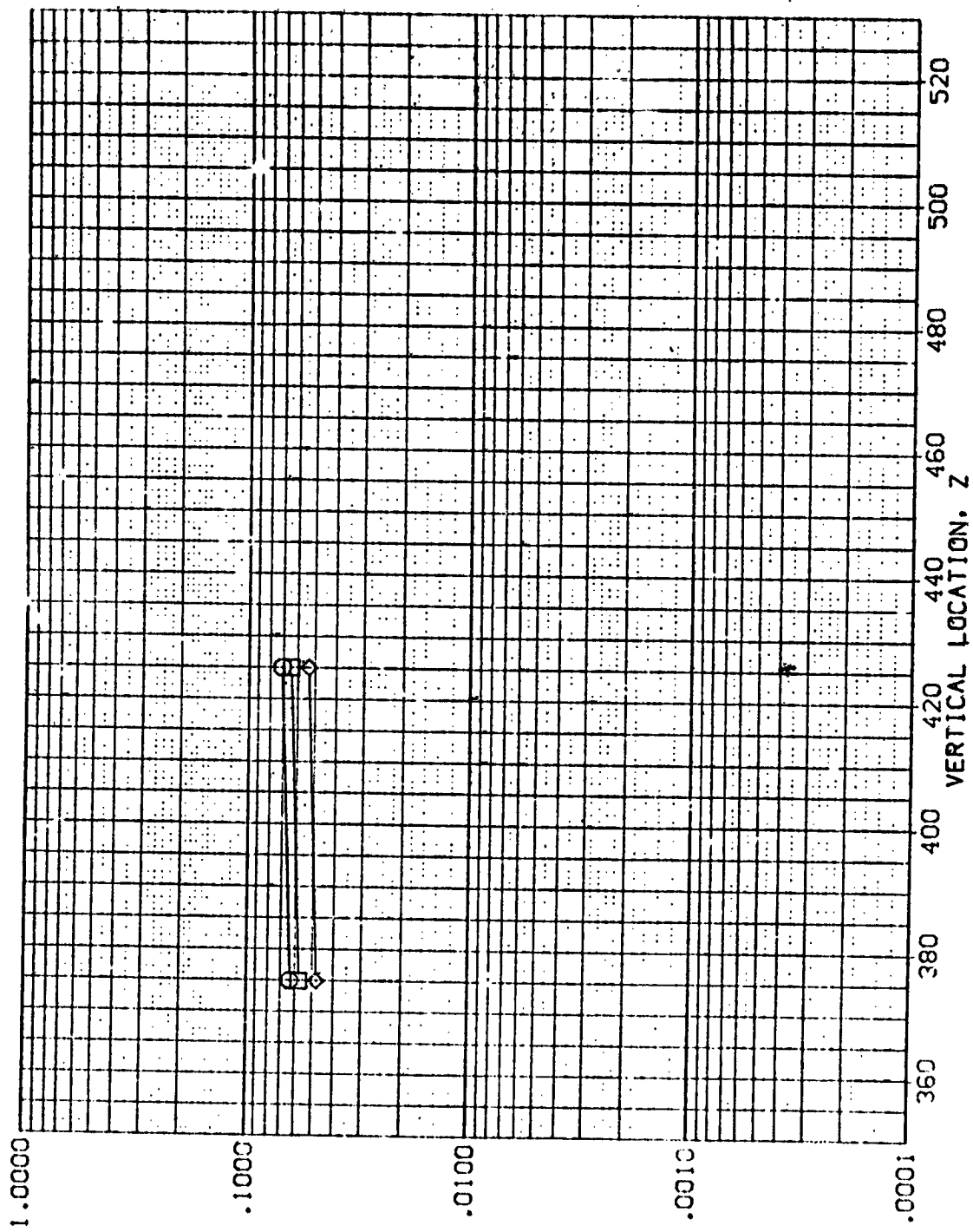


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB25)

SYMBOL HAW/HT X/L MACH  
 ◊ .850 .400 5.219  
 □ .900  
 ◻ 1.000

PARAMETRIC VALUES  
 ALPHA -90.000  
 PN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

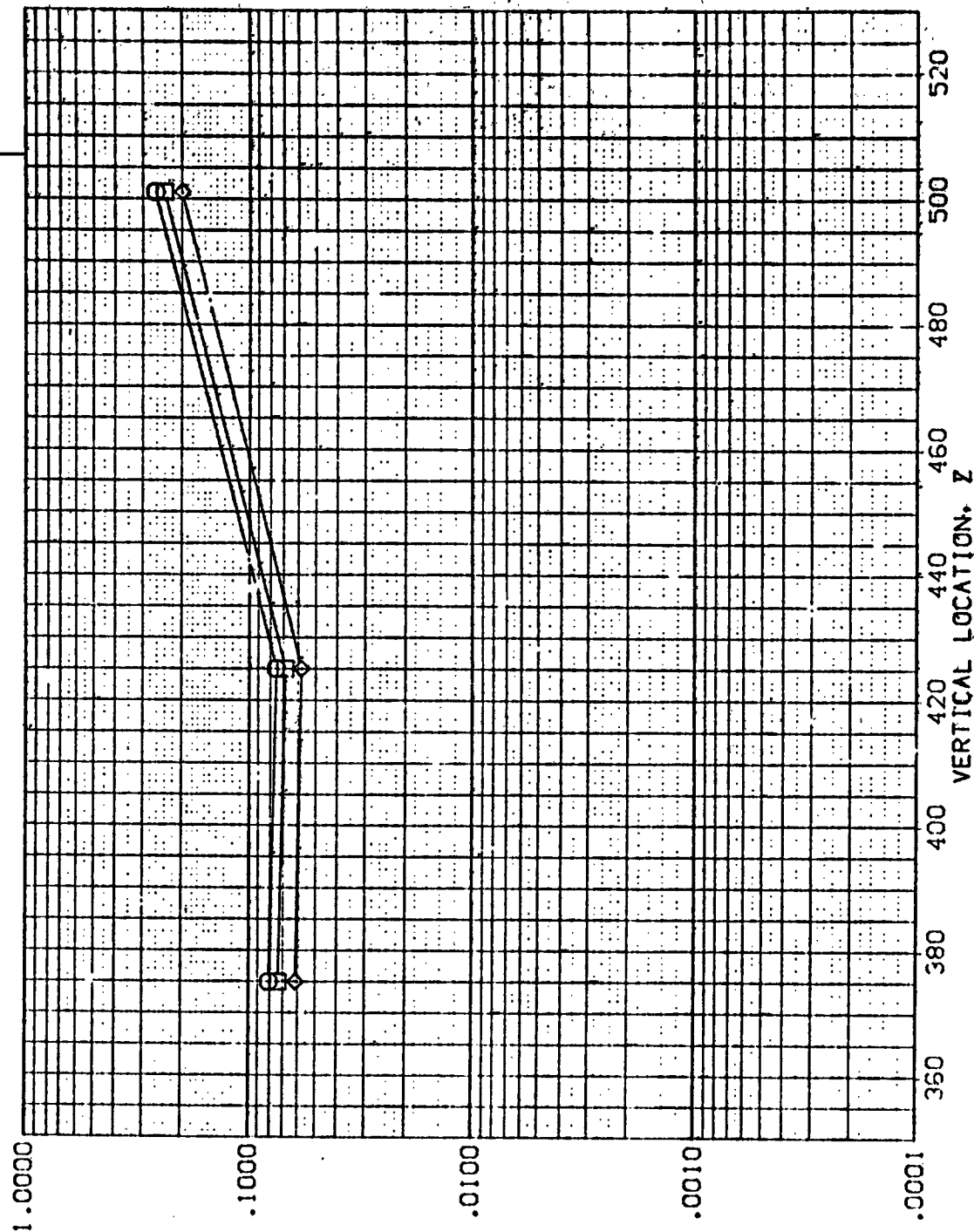


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AMES 3.5-195 IH28 01 BODY SIDEWALL (REVB25)

SYMBOL  
◇  
□

HAY/HT X/L MACH  
.850 .500 5.219  
.900  
1.000

PARAMETRIC VALUES  
ALPHA -90.000 BETA .000  
RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

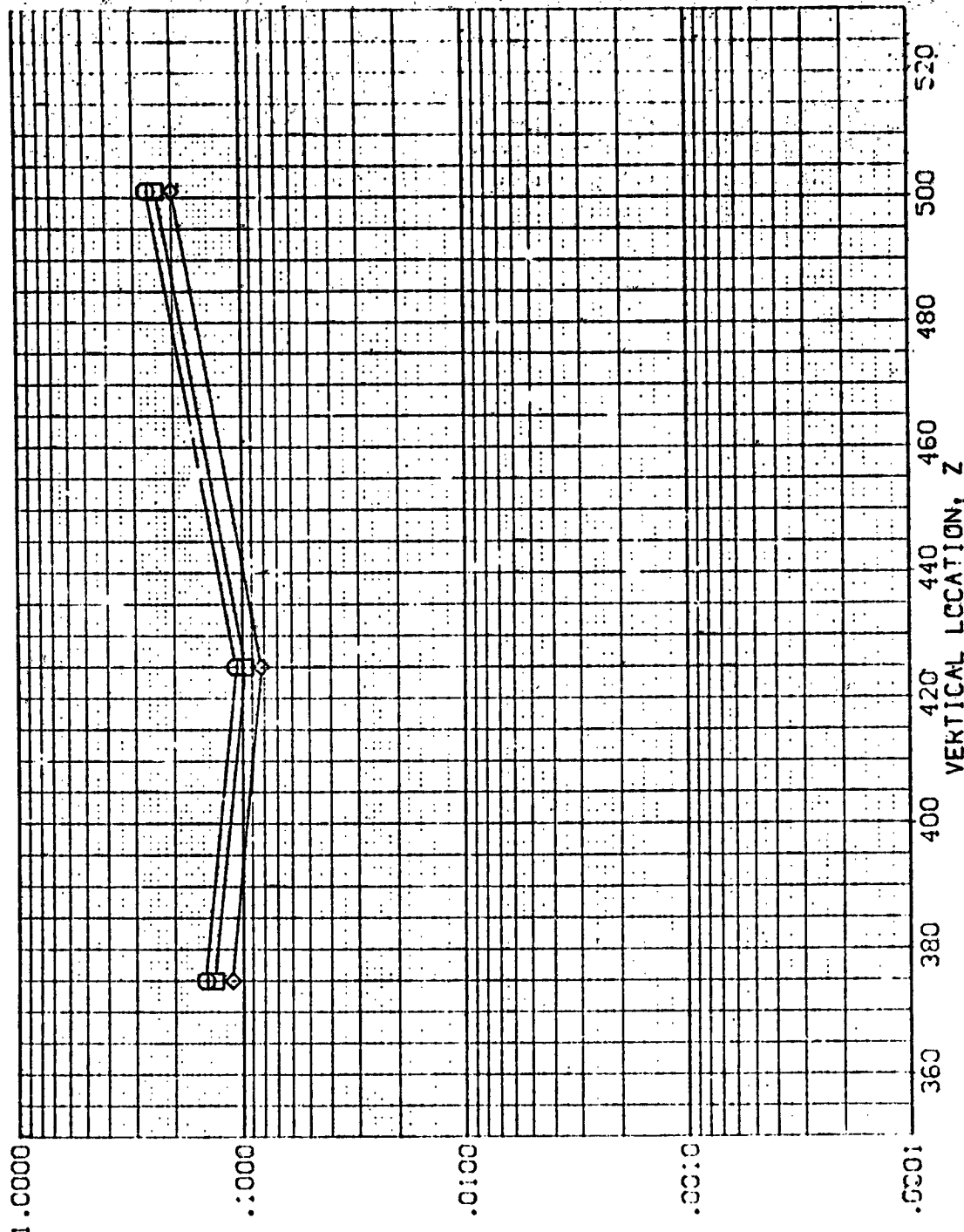


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB25)

100-443887-100  
 100-443887-100  
 100-443887-100

RAW/WT	X/L	YACH
.850	.600	5.219
.900		
1.000		

PARAMETRIC VALUES	
ALPHA	BETA
-90.000	1.000
PN/L	

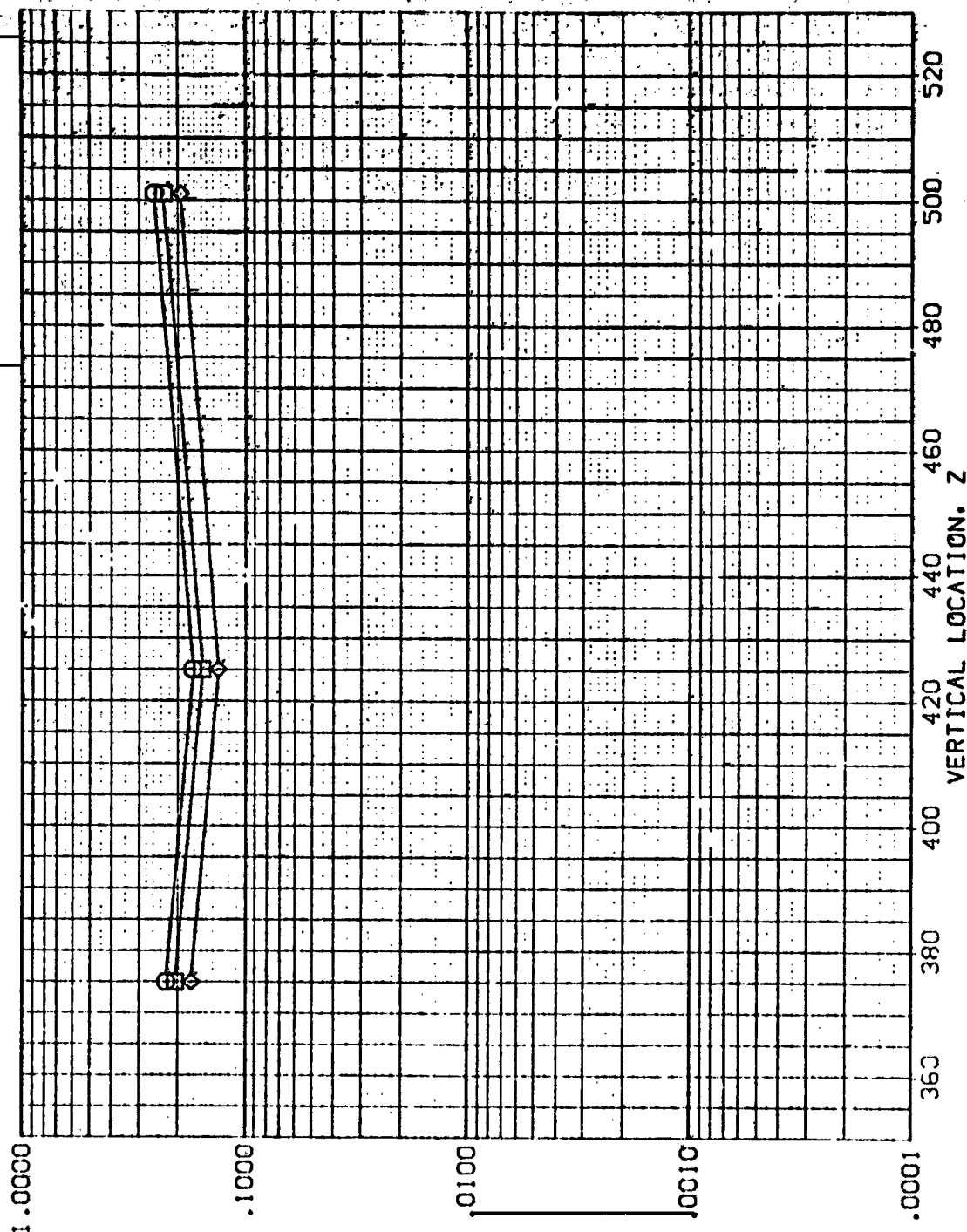
RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$ 

FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REV825)

SI-32-  
HA#1-17  
.850  
.900  
1.000

K/L  
.700  
MACH  
5.219

PARAMETRIC VALUES  
ALPHA  
RN/L  
-90.000  
1.000  
BETA  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

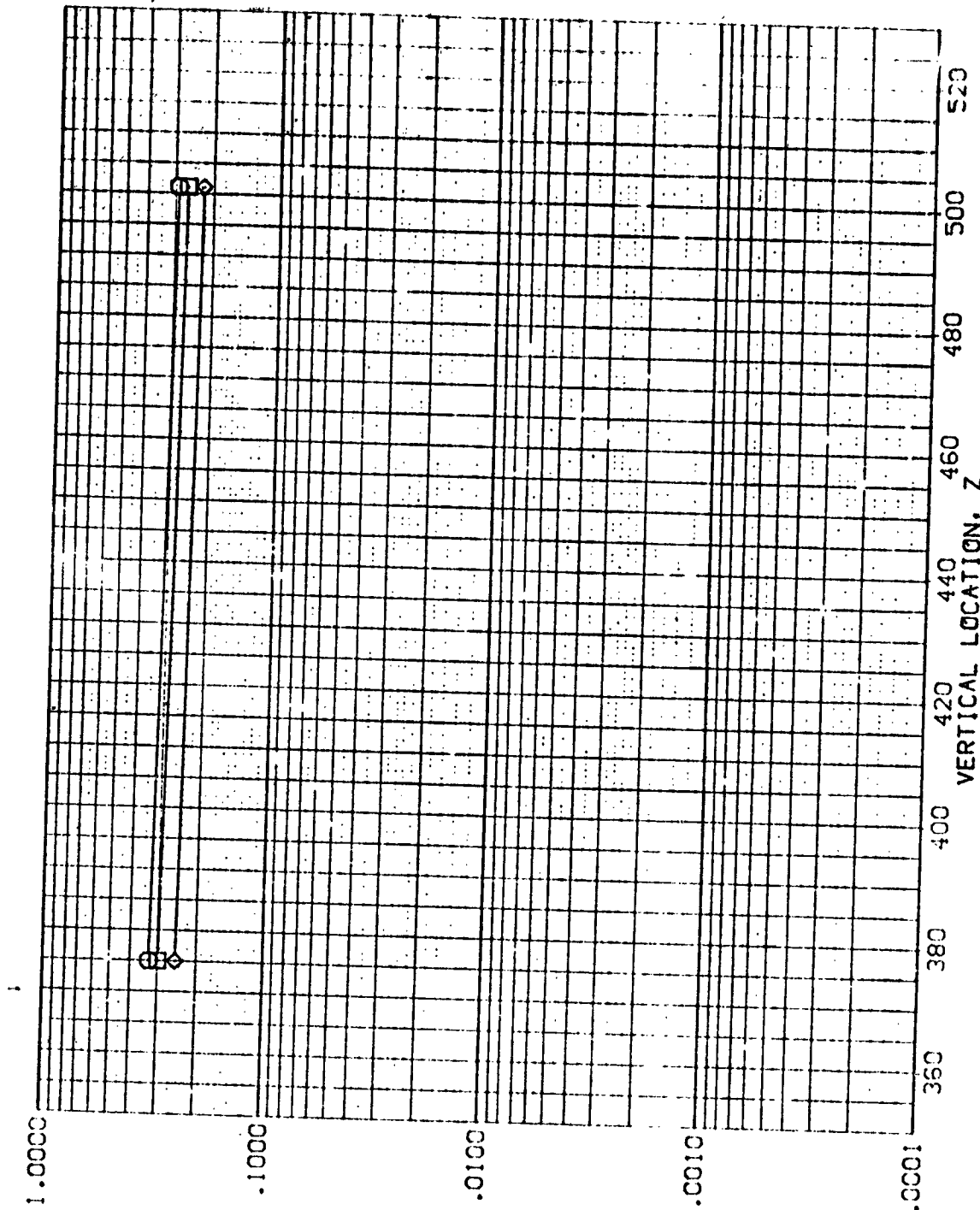


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB26)

5-322  
 1.000

WALL/RT  
 .950  
 .900  
 .800  
 1.000

MACH  
 5.220

X/L  
 .300

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -6C 000  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

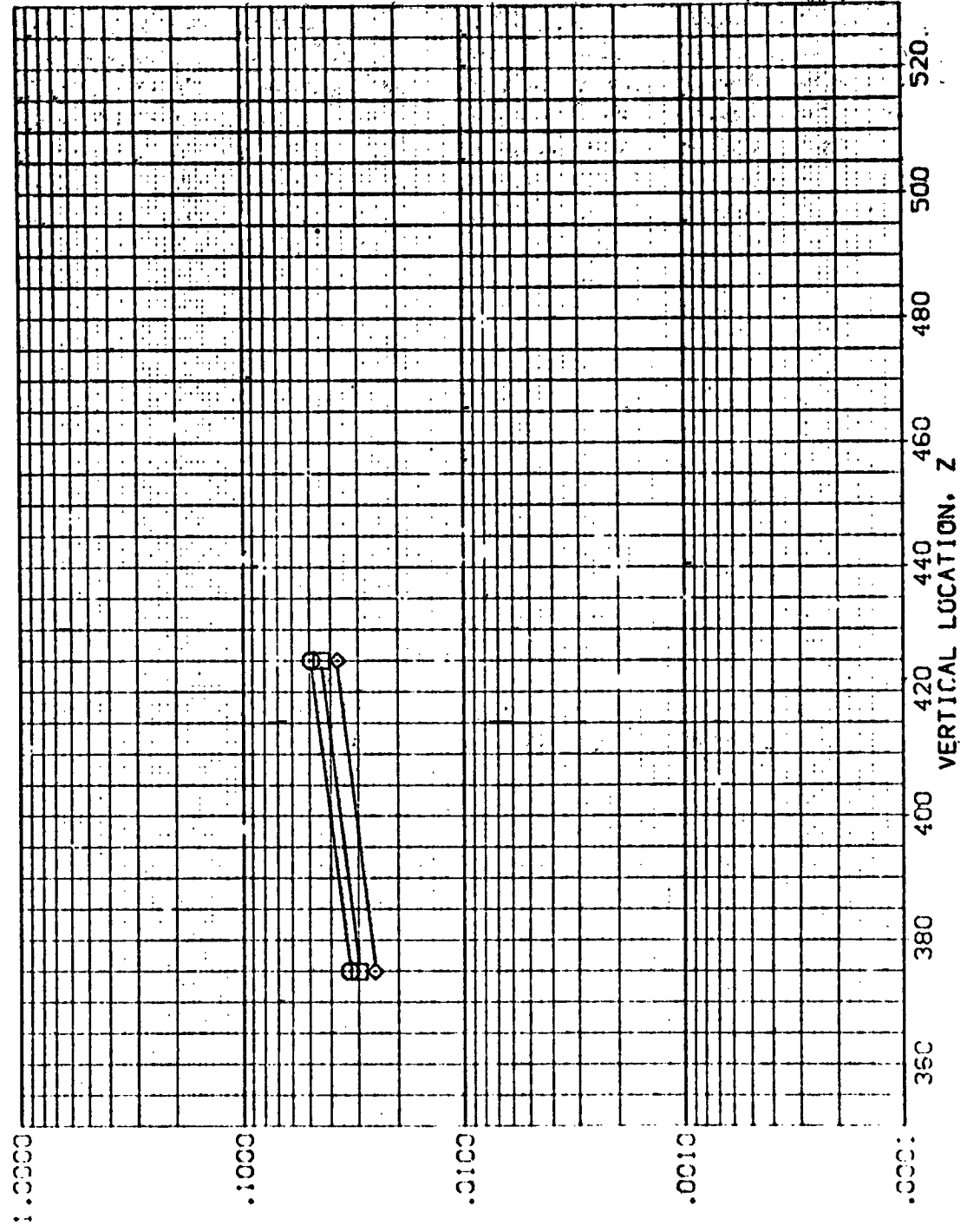


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 3.5-195 IH28 01 BODY SIDEWALL

(REV B26)

$\rho V^2$   
 1.000  
 .900  
 .800  
 .700  
 .600  
 .500  
 .400  
 .300  
 .200  
 .100  
 0.000

MACH  
5.220

$\gamma/L$   
.400

PARAMETRIC VALUES  
 ALPHA  
 PN/L  
 BETA  
 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

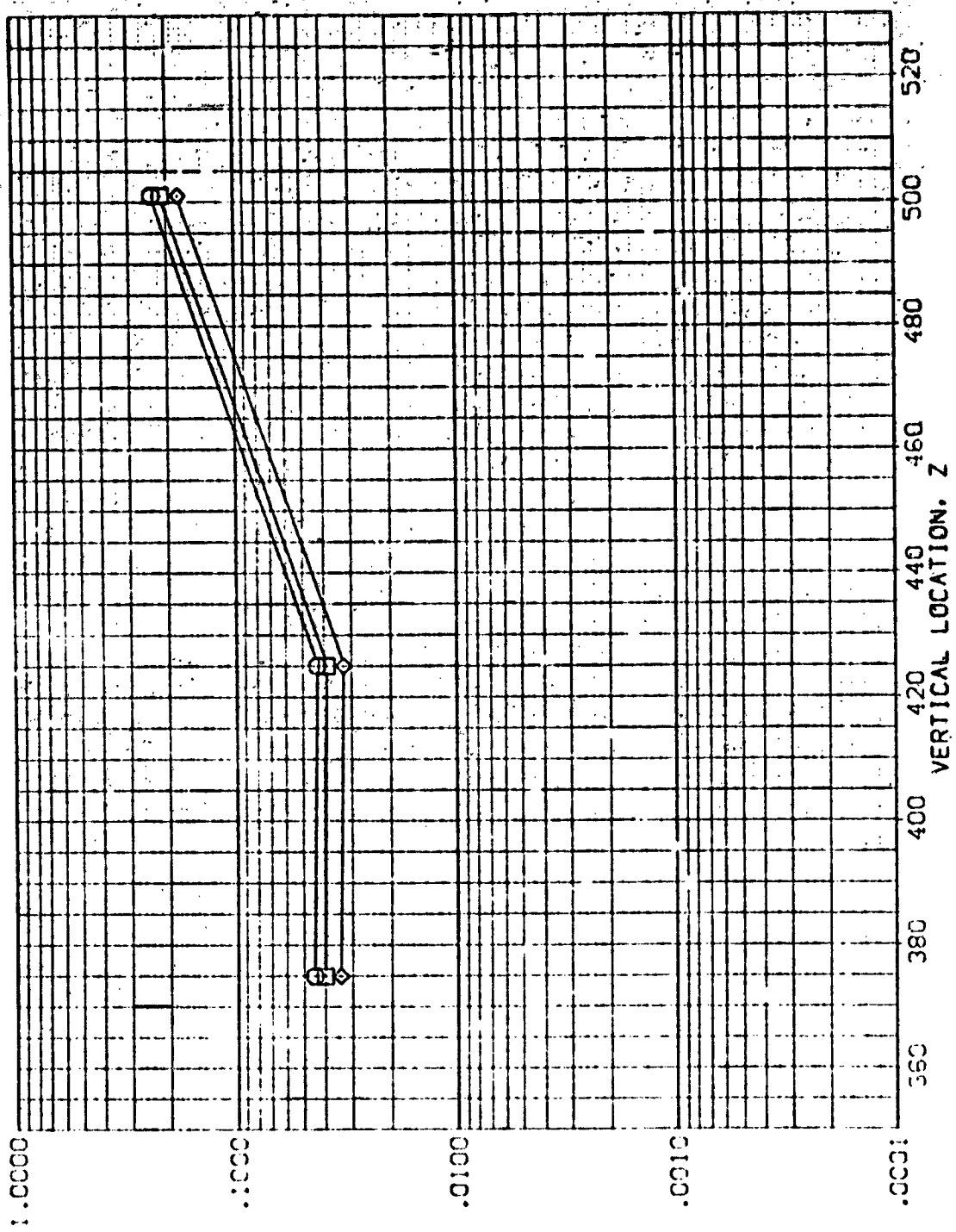


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AVES 3.5-195 IH28 01 BODY SIDEWALL

(REVB26)

PARAMETRIC VALUES  
ALPHA -60.000 BETA 1.000  
RMA/L

SYNTH HAW/H" X/L WICH  
.850 .500 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

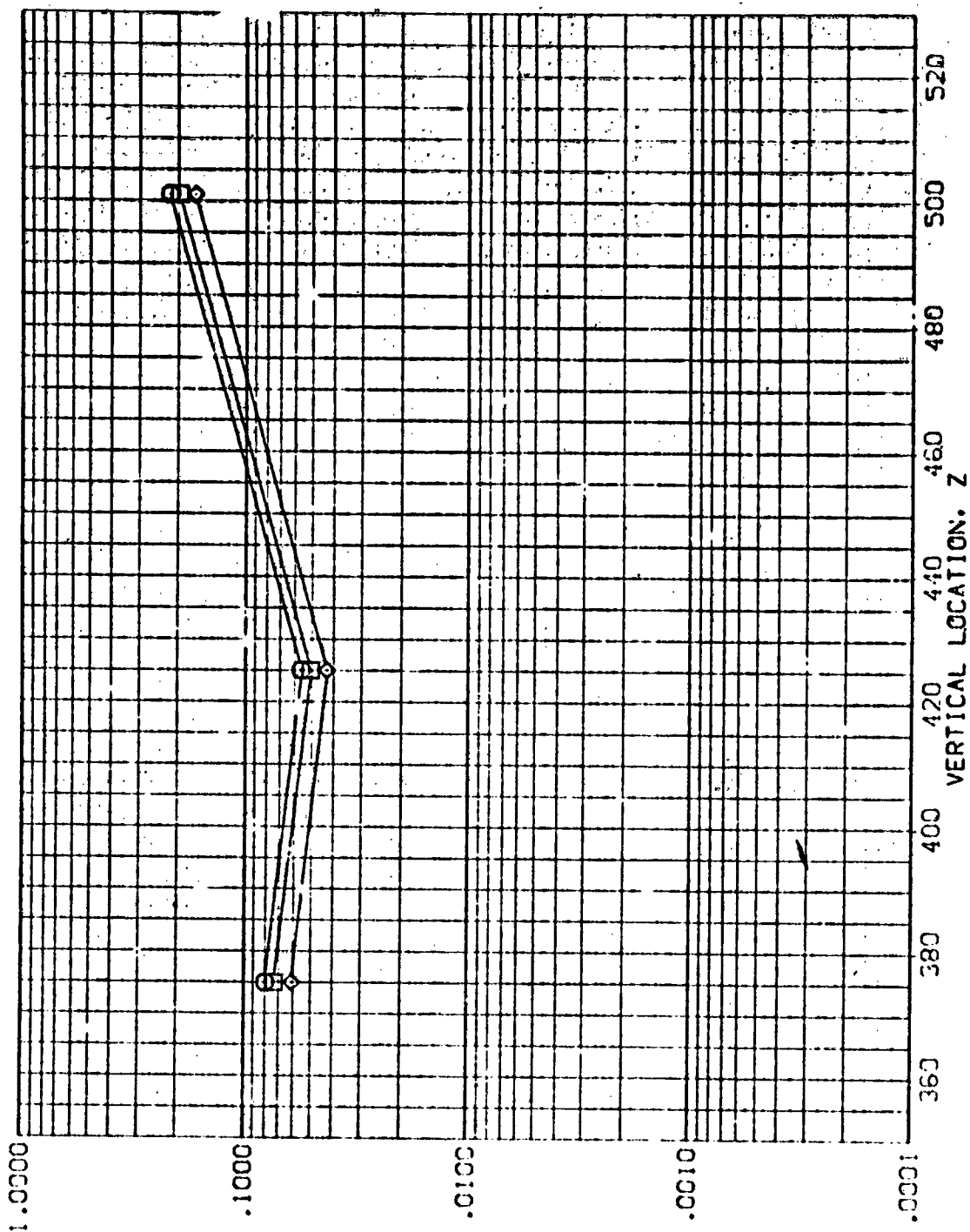


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

ANES 3.5-195 1428 01 BODY SIDEWALL (RE-325)

SYMBOL HAW/WT K/L MACH  
 ◇ .850  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -50.000  
 BETA 1.000  
 RN/L 1.000

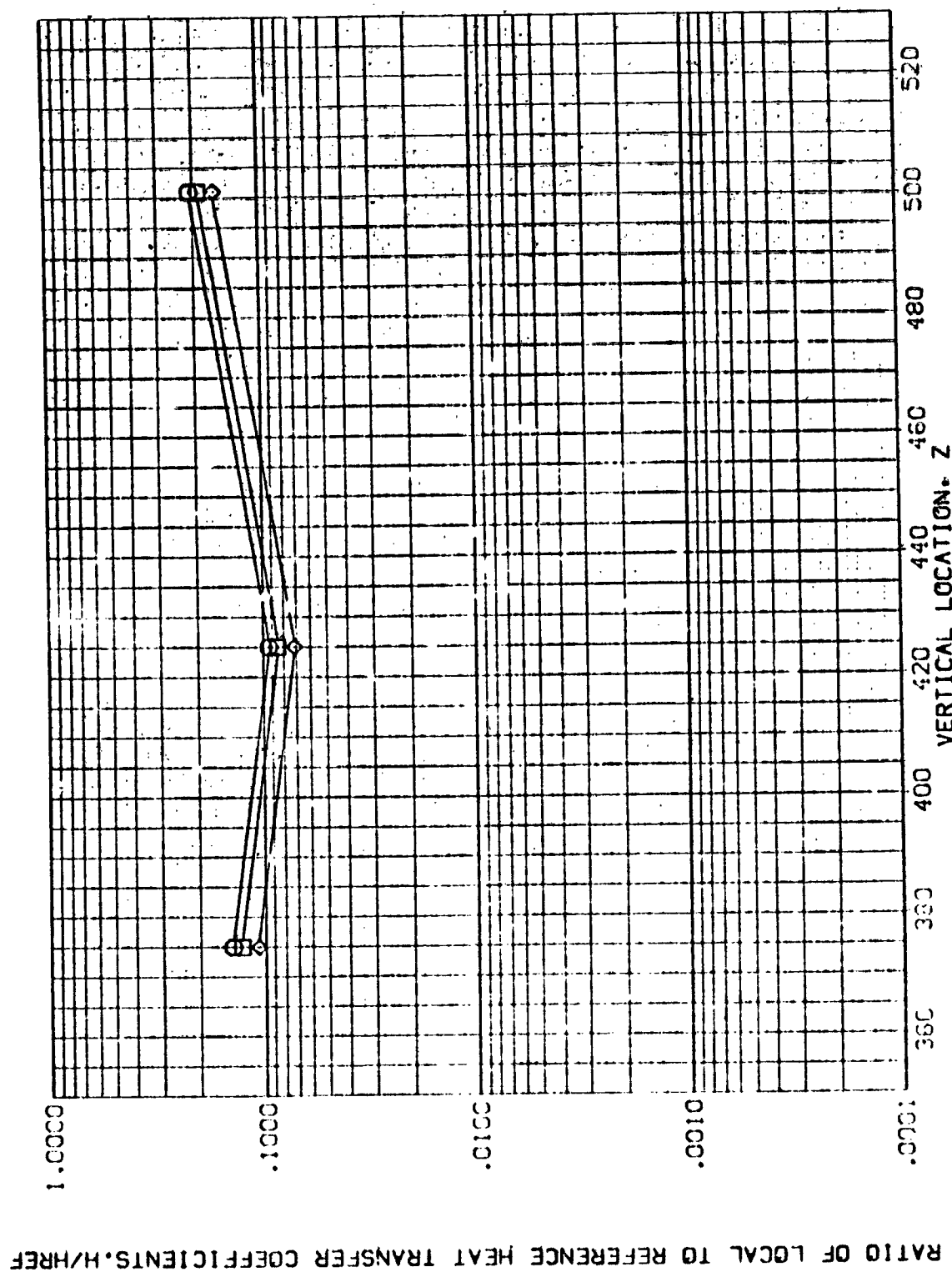


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

(REVB26)

BODY SIDEWALL

1-28 01

PARAMETRIC VALUES  
ALPHA -60.000 BETA .000  
P/L 1.000

0.000  
0.010  
0.100  
1.000  
5.000  
10.00

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

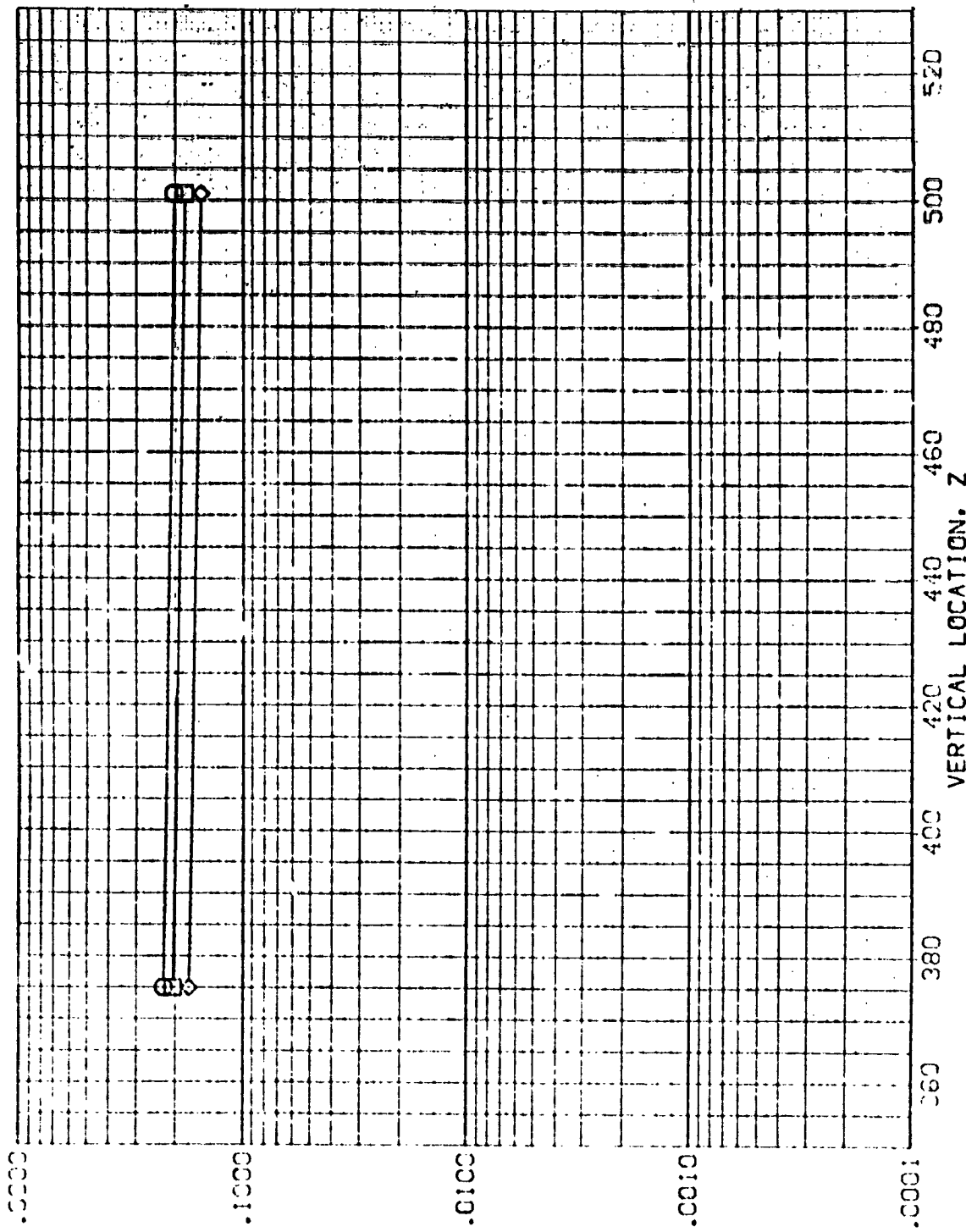


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE



AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB27)

SYMBOL H/W/H<sub>T</sub> X/L MACH  
 ◊ .850 .300 5.220  
 ◻ .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000  
 BETA 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

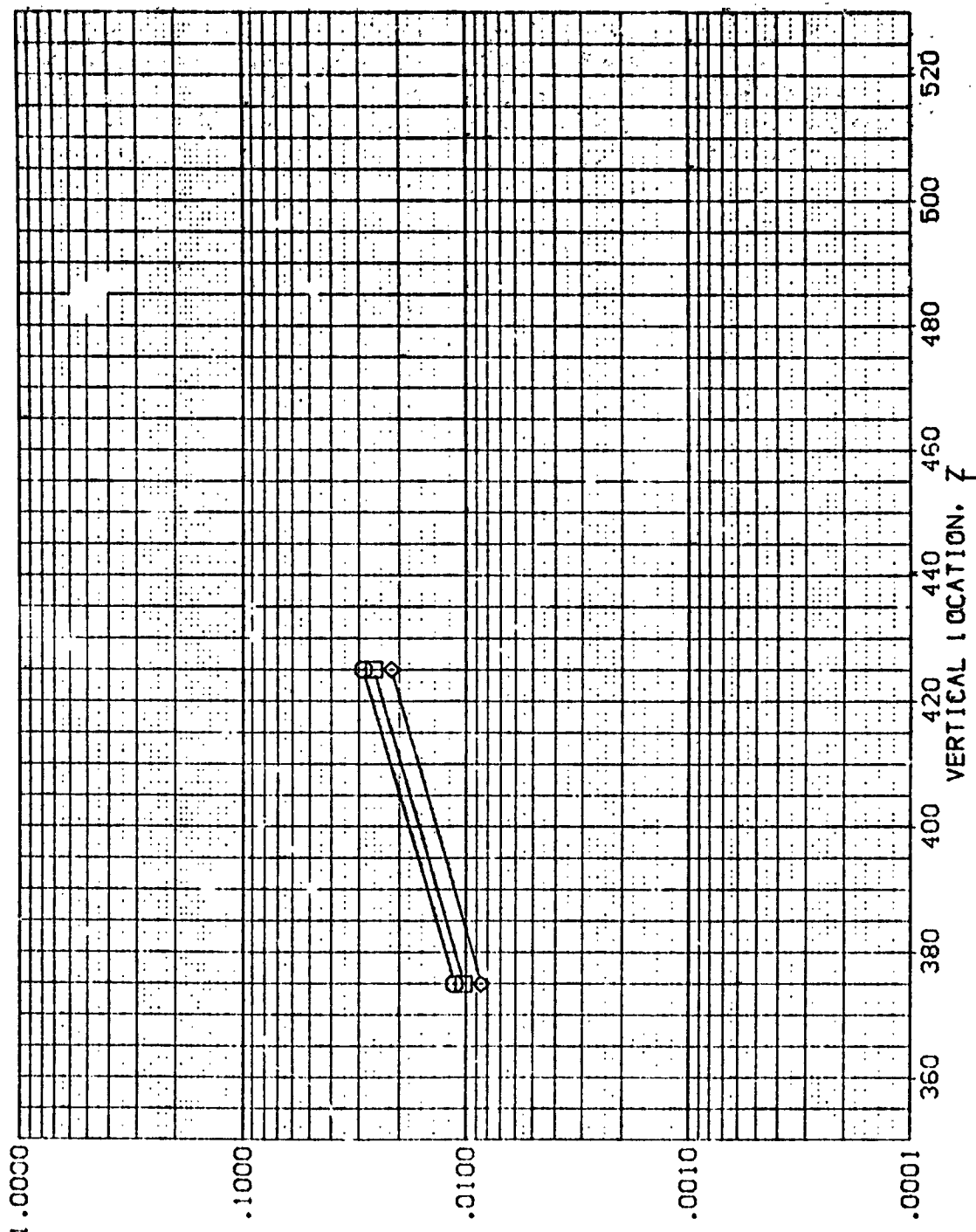


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 IH28 01 BODY SIDEWALL

(REVB27)

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
RN/L 1.000

SYMBOL HAW/HT X/L MACH  
◇ .850 .400 5.220  
□ .900  
○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

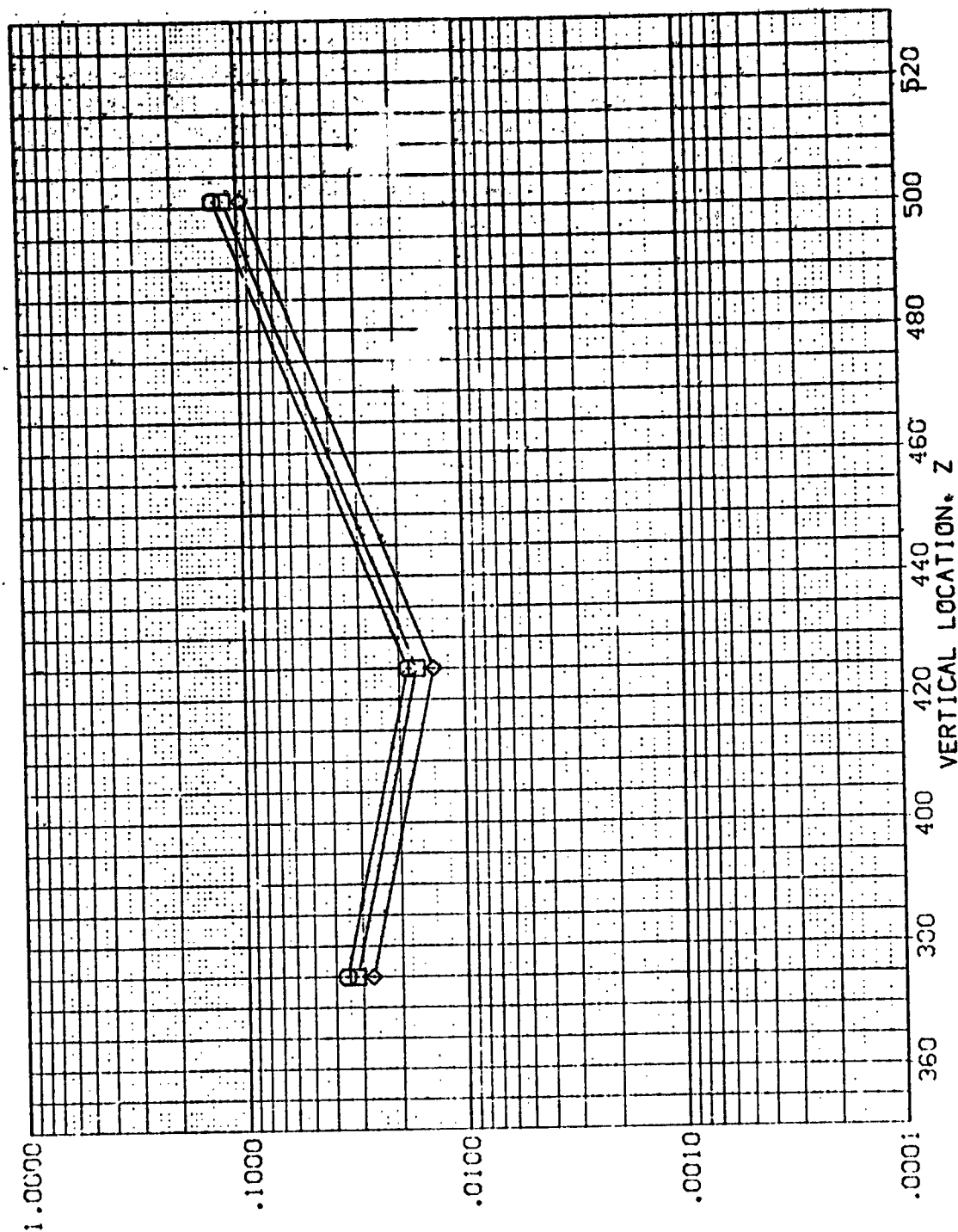


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

# AMES 3.5-195 1H28 01 BODY SIDEWALL

(REVB27)

SYMBOL

HA/HT  
.850  
.900  
1.000

X/L  
.500

MACH  
5.220

PARAMETRIC VALUES

-30.000 BETA

1.000

ALPHA  
RV/L

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

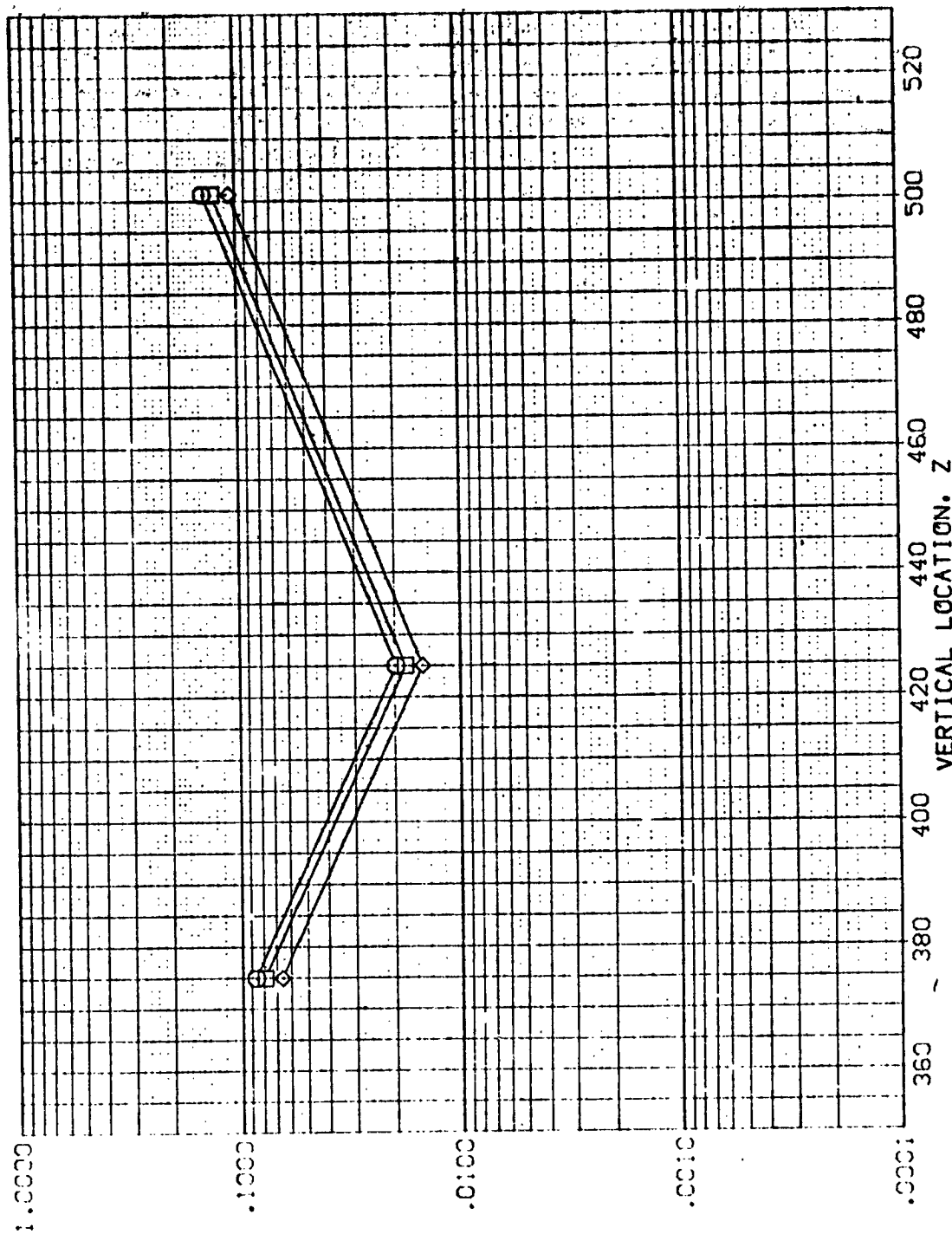


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AXES 3.5-:95 IH28 01 BODY SIDEWALL

(REV B27)

SYMBL

1.000  
006.  
850  
14/14

009.

**MACH 5.220**

ALPHA

PARAF-30.08

ΒΕΤΑ

000.

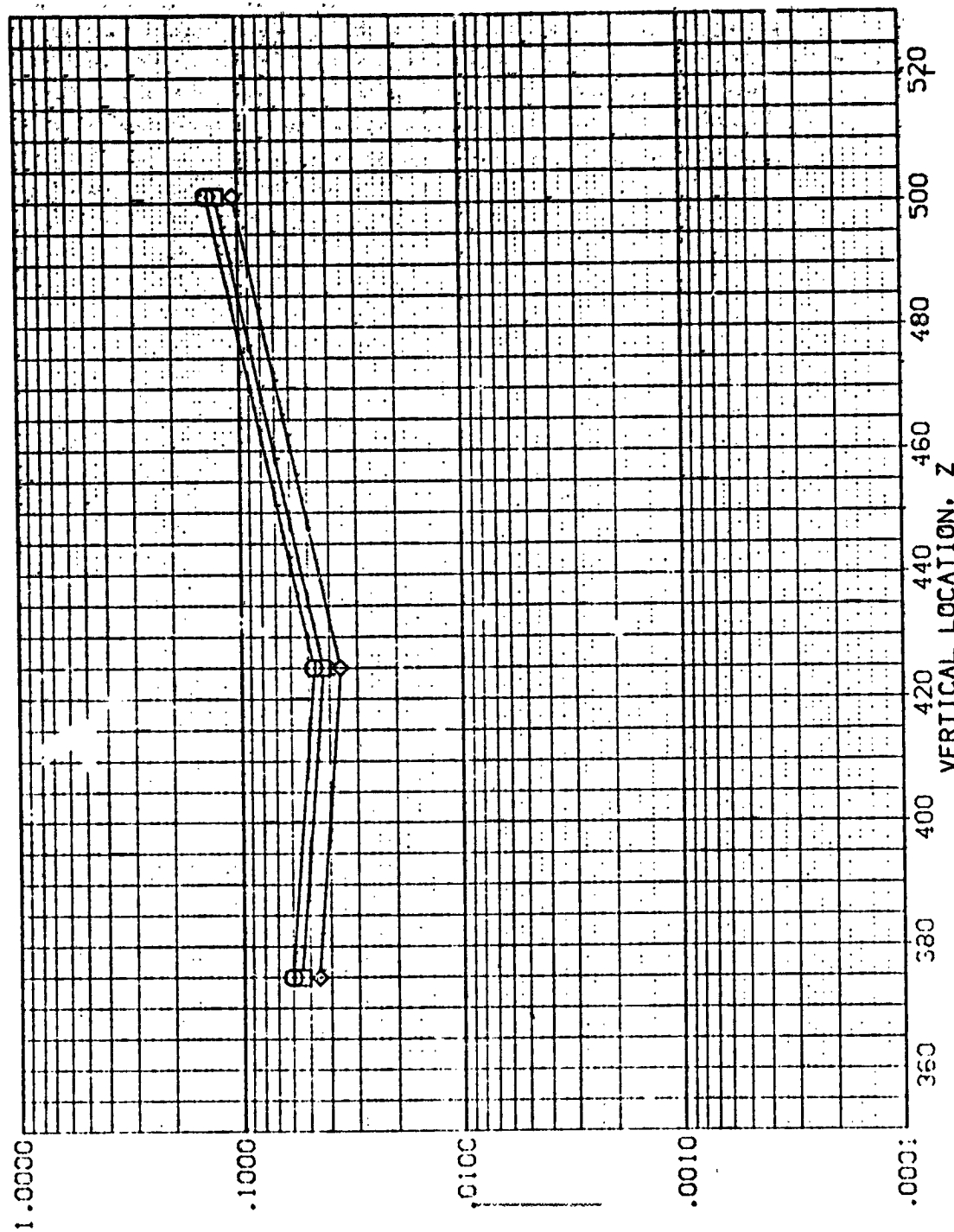
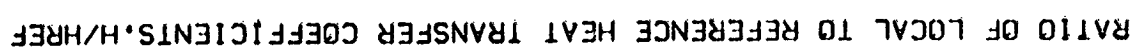


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

AMES 3.5-195 1H28 01 BODY SIDE:ALL

(REV B27)

0001  
005  
058  
1H/MH

1.00  
1.00  
1.00

1.00  
1.00  
1.00

1.00  
1.00  
1.00

PARAMETRIC VALUES	
ALPHA	BETA
-30.000	
1.000	

BETA  
-30.000

55-06-  
BETA

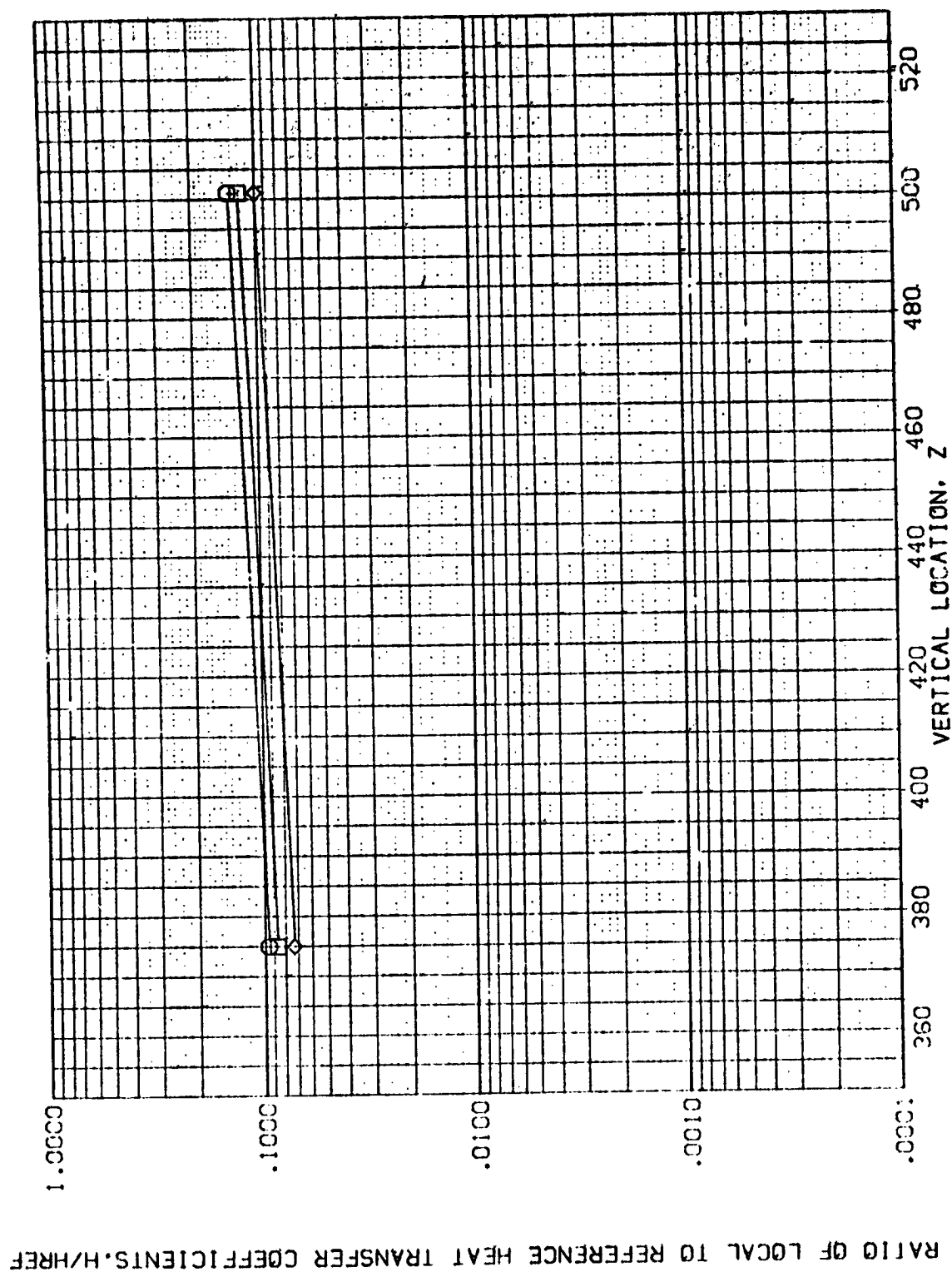


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

DATA SET SYMBOL

CONFIGURATION DESCRIPTION

AVES 3.5-195 1428 01 BODY SIDEWALL  
 AVES 3.5-195 1428 01 BODY SIDEWALL  
 AVES 3.5-195 1428 01 BODY SIDEWALL  
 AVES 3.5-195 1428 01 BODY SIDEWALL

ALPHA BETA RV/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

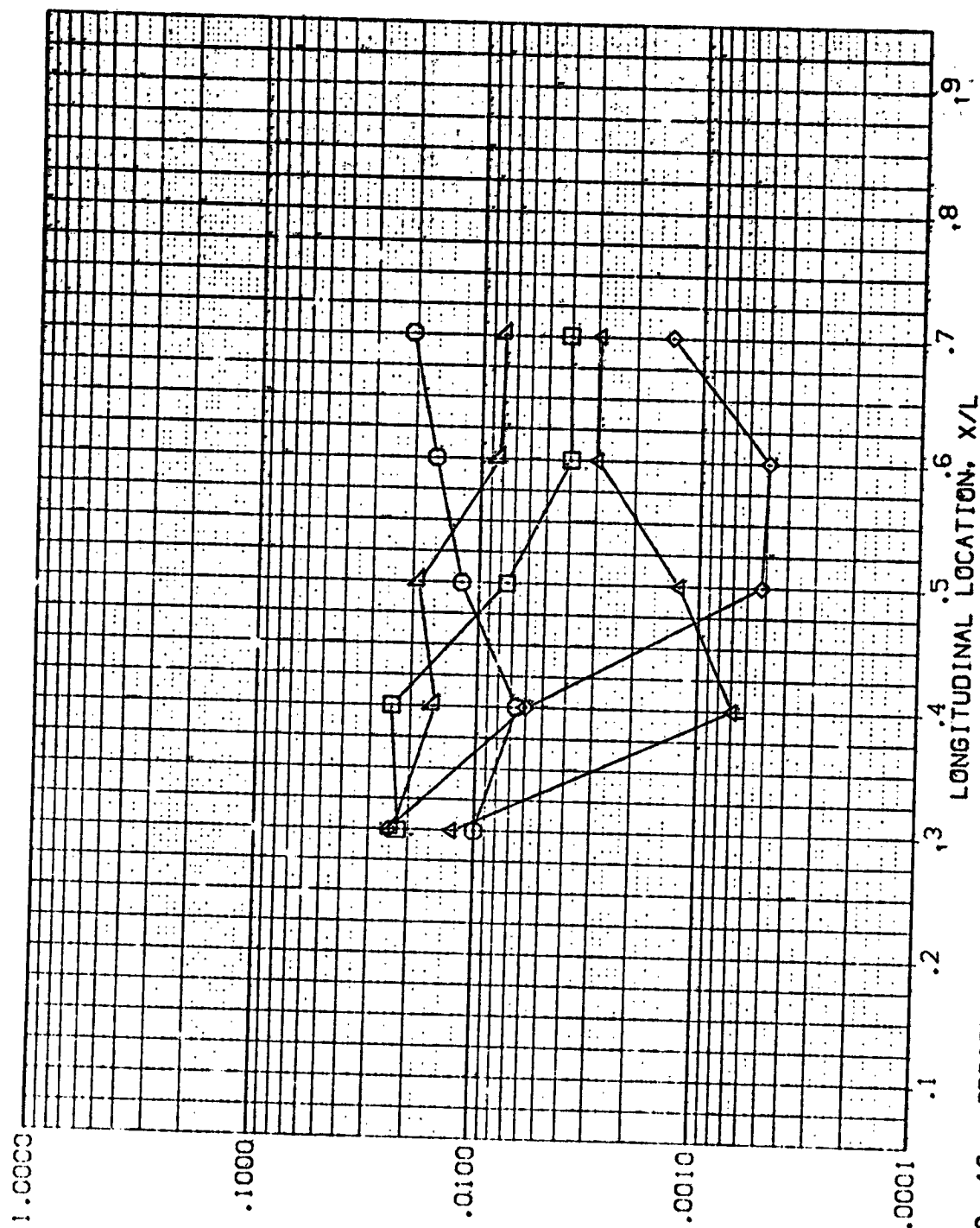


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 Z = 375.000

DATA SET SYMBOL  
(REV819)  
(REV820)  
(REV821)  
(REV822)  
(REV823)

CONFIGURATION DESCRIPTION  
AMES 3.5-195 IH28 O1 BODY SIDEWALL  
AMES 3.5-195 IH28 O1 BODY SIDEWALL  
AMES 3.5-195 IH28 O1 BODY SIDEWALL  
AMES 3.5-195 IH28 O1 BODY SIDEWALL  
AMES 3.5-195 IH28 O1 BODY SIDEWALL

ALPHA BET<sup>2</sup> PN/L  
.000 .000 1.000  
30.000 .000 1.000  
60.000 .000 1.000  
90.000 .000 1.000  
120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

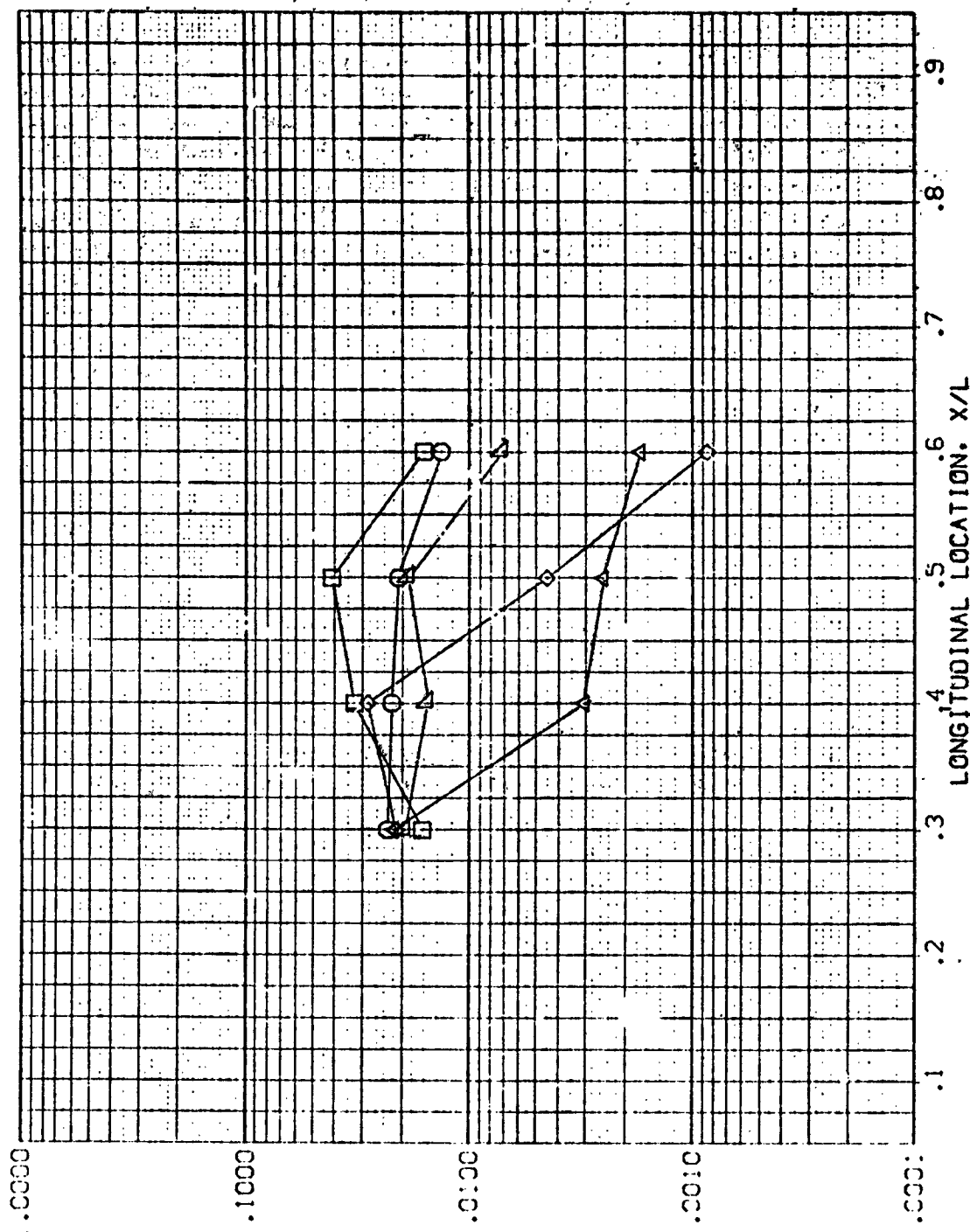


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 Z = 425.000

DATA SET SYMBOL  
 (REV19)  
 (REV20)  
 (REV21)  
 (REV22)  
 (REV23)

CONFIGURATION DESCRIPTION  
 ASES 3-5-195 1-28 01 BODY SIDEWALL  
 ASES 3-5-195 1-28 01 BODY SIDEWALL  
 ASES 3-5-195 1-28 01 BODY SIDEWALL  
 ASES 3-5-195 1-28 01 BODY SIDEWALL  
 ASES 3-5-195 1-26 01 BODY SIDEWALL

ALPHA BETA RV/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

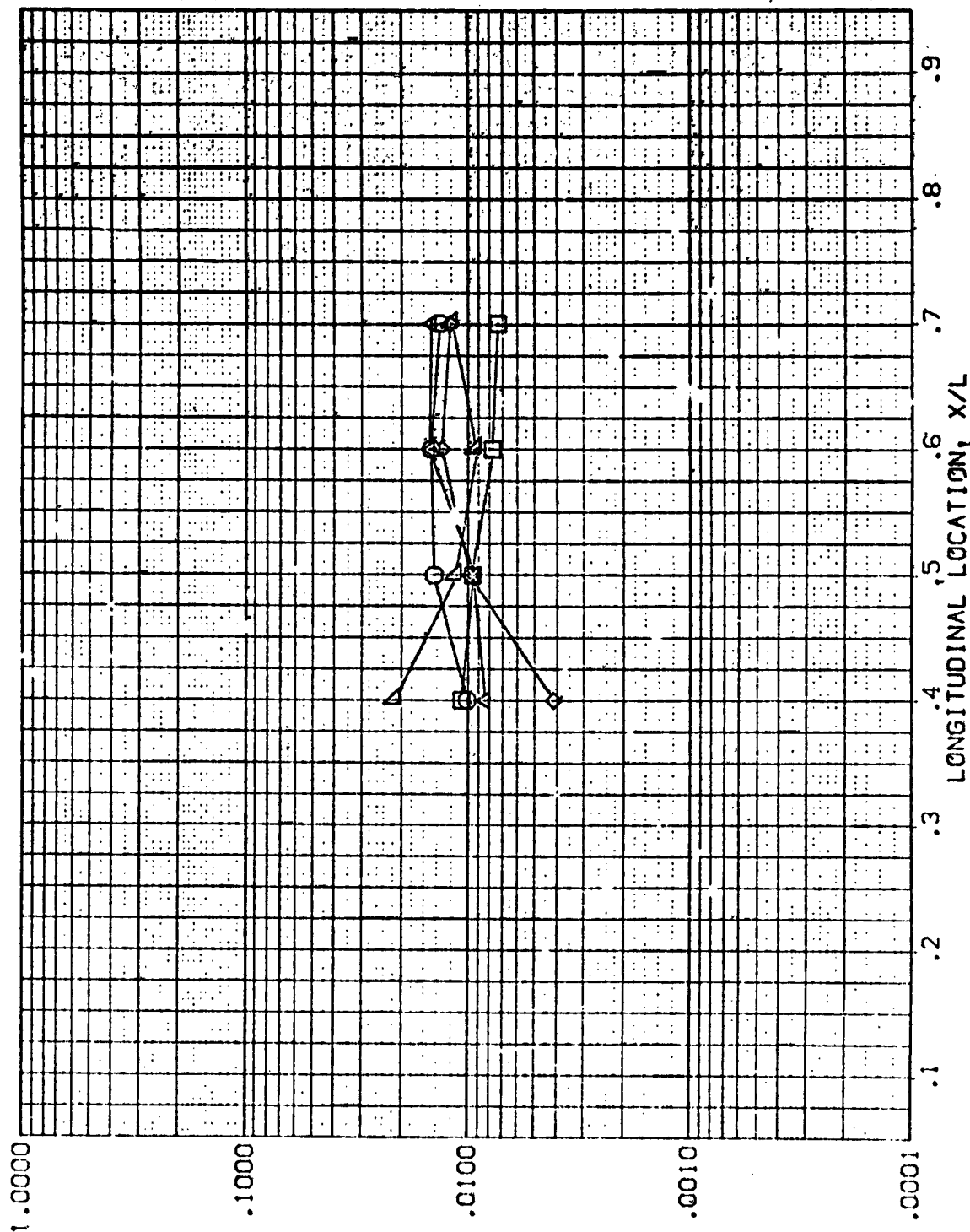


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 Z = 501.000



DATA SET SYMBOL CONFIGURATION DESCRIPTION

ALPHA BETA RN/L

AMES 3.5-195 1428 C1 BODY SIDEWALL  
 AMES 3.5-195 1428 C1 BODY SIDEWALL  
 AMES 3.5-195 1428 C1 BODY SIDEWALL  
 AMES 3.5-195 1428 C1 BODY SIDEWALL  
 AMES 3.5-195 1428 C1 BODY SIDEWALL

.000  
 -30.000  
 -60.000  
 -90.000  
 -120.000

.000  
 .000  
 .000  
 .000  
 .000

1.000  
 1.000  
 1.000  
 1.000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

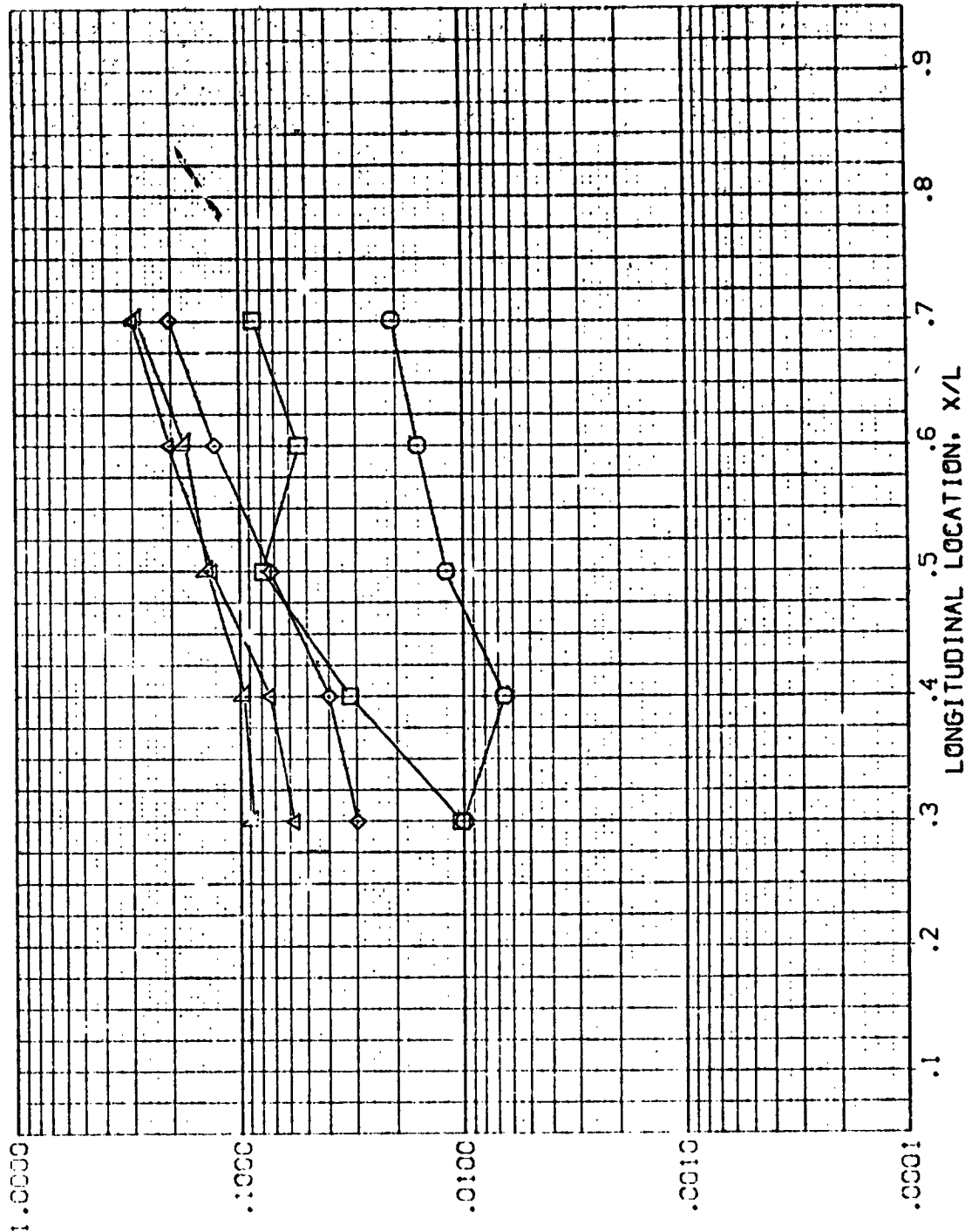


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 Z = 375.000

DATA SET SYMBOL CONFIGURATION DESCRIPTION

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
(RE1B19)	AMES 3.5-195 IH28 CI	.000	.000	1.000
(RE1B27)	AMES 3.5-195 IH28 CI	-30.000	.000	1.000
(RE1B26)	AMES 3.5-195 IH28 CI	-60.000	.000	1.000
(RE1B25)	AMES 3.5-195 IH28 CI	-90.000	.000	1.000
(RE1B24)	AMES 3.5-195 IH28 CI	-120.000	.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

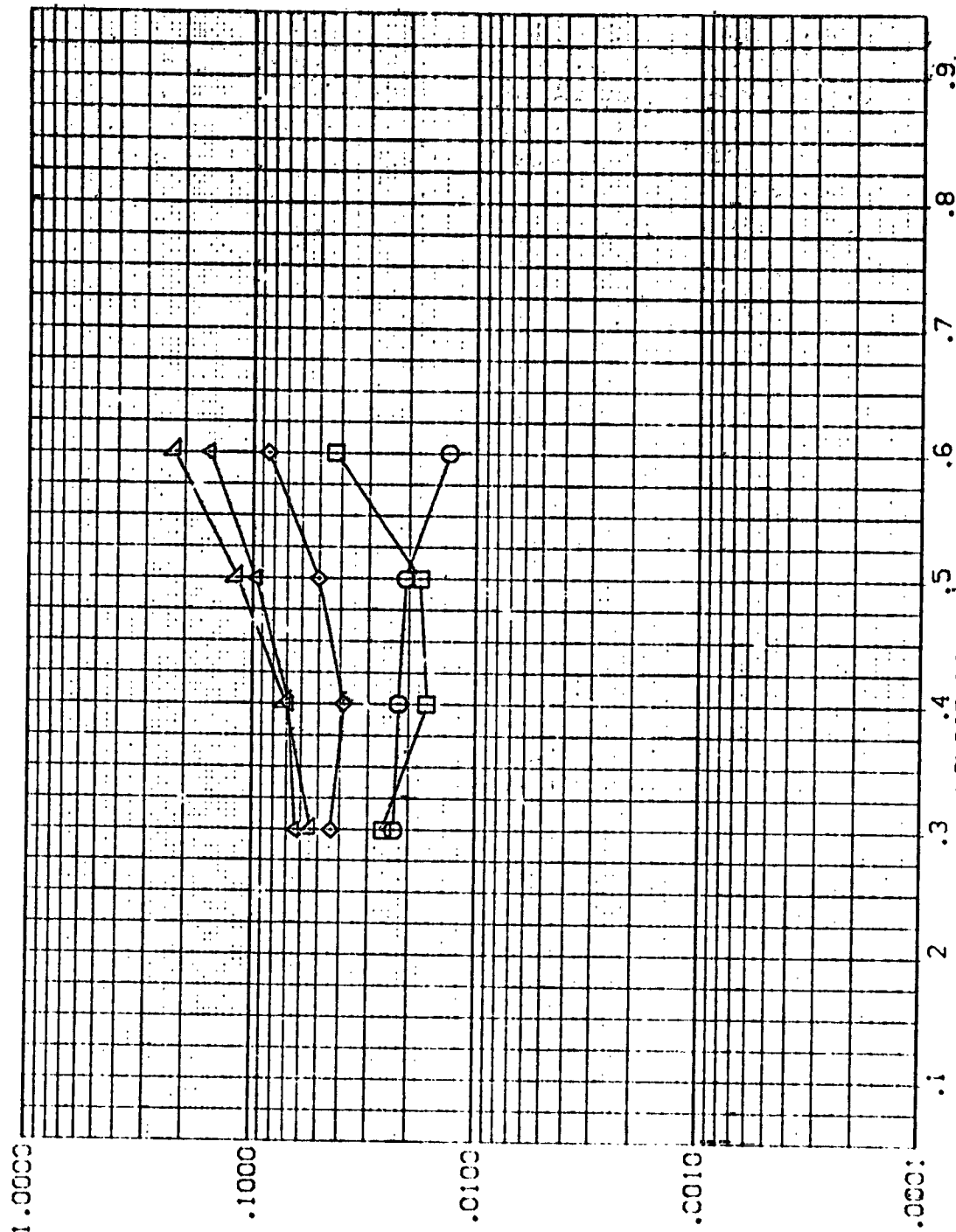
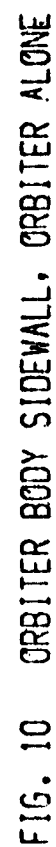


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

WACH = 5.300 HAW/HT = .900 Z = 425.000

A-674	000000 000000 000000 000000 000000 000000	B-674	000000 000000 000000 000000 000000 000000	C-674	000000 000000 000000 000000 000000 000000
-------	--	-------	--	-------	--


$$5.330 \times 10^6 = 14.744 \times 10^6 \times Z = 51.000$$

DATA SET SYMBOL  
(P8.019)  
(P8.020)  
(P8.021)  
(P8.022)  
(P8.023)

CONFIGURATION DESCRIPTION  
AES 3.5-195 1428 01 BODY SIDE WALL  
AES 3.5-195 1428 01 BODY SIDE WALL  
AES 3.5-195 1428 01 BODY SIDE WALL  
AES 3.5-195 1428 01 BODY SIDE WALL  
AES 3.5-195 1428 01 BODY SIDE WALL

ALPHA BETA RV/L  
.000 .000 1.000  
30.000 .000 1.000  
60.000 .000 1.000  
90.000 .000 1.000  
120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

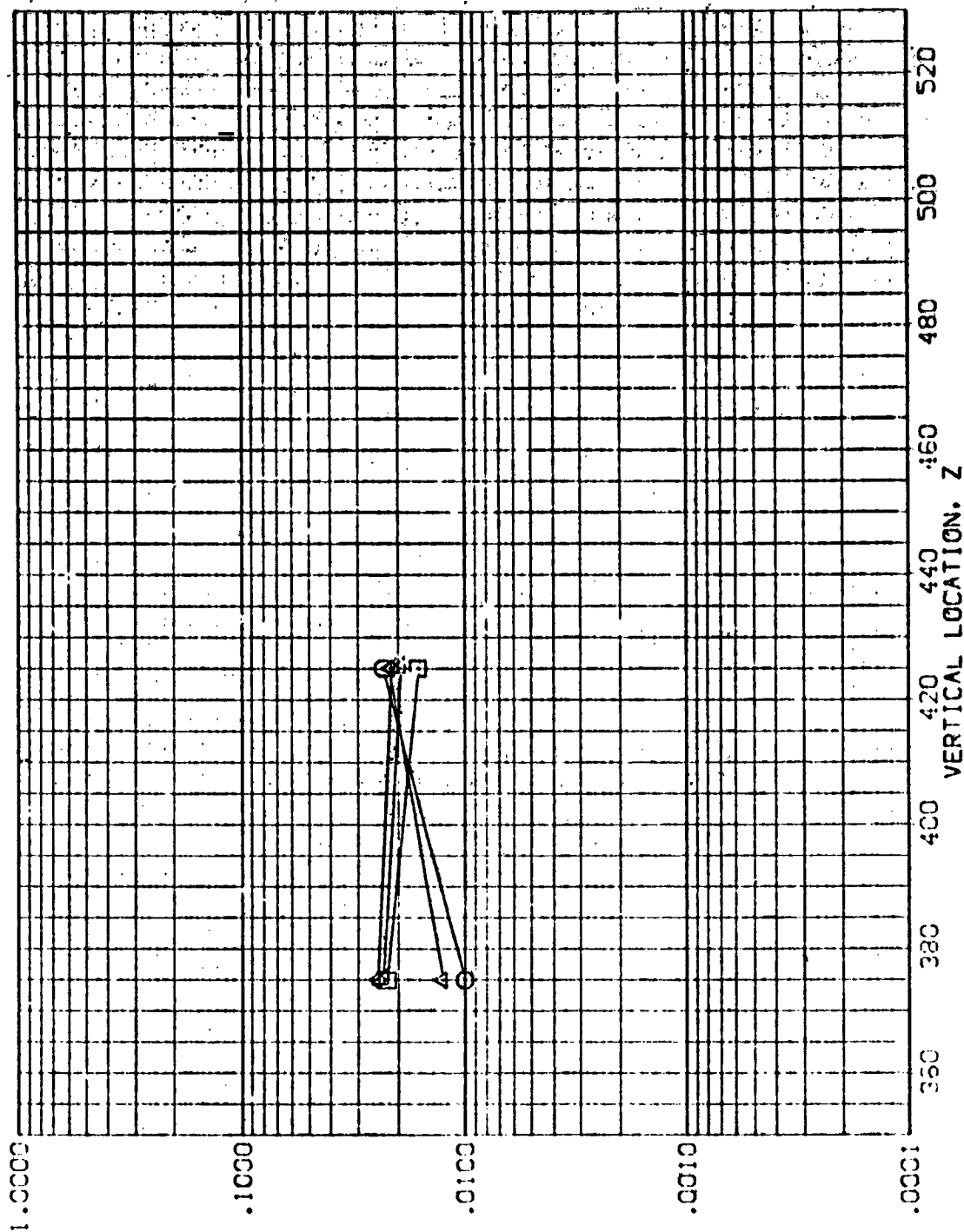
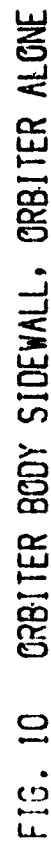


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

WACH = 5.000 LAM/LT = .000 X/L = .300

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$


$$1.33 \times 10^5 \times 1.99 \times 10^{-5} = 2.65$$



DATA SET SYMBOL CONFIGURATION DESCRIPTION ALPHA BETA GAMMA

00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000
00000000	AVES 3.5-195 1428 01	BCD: SIDEWALL	.000	.000	.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

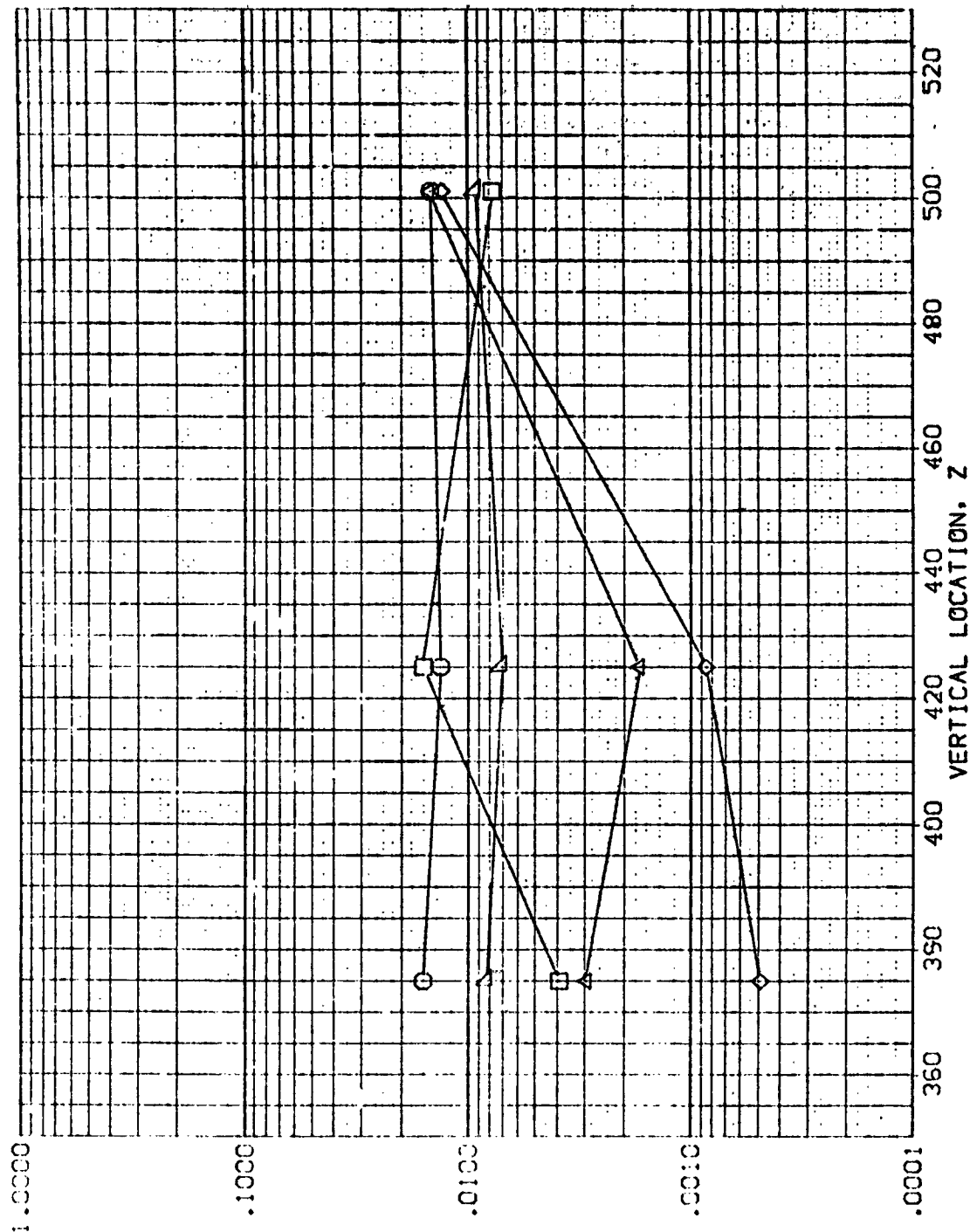


FIG. 10 ORBITER BODY SIDEWALL, GABITER ALONE

MACH = 5.300 HAW/HT = .900 X/L = .600

DATA SET SYMBOL  
 (REV19)  
 (REV20)  
 (REV21)  
 (REV22)  
 (REV23)

CONFIGURATION DESCRIPTION  
 AMES 3.5-195 IH28 01 BODY SIDEWALL  
 AMES 3.5-195 IH28 01 BODY SIDEWALL  
 AMES 3.5-195 IH28 01 BODY SIDEWALL  
 AMES 3.5-195 IH28 01 BODY SIDEWALL

ALPHA BETA RV/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

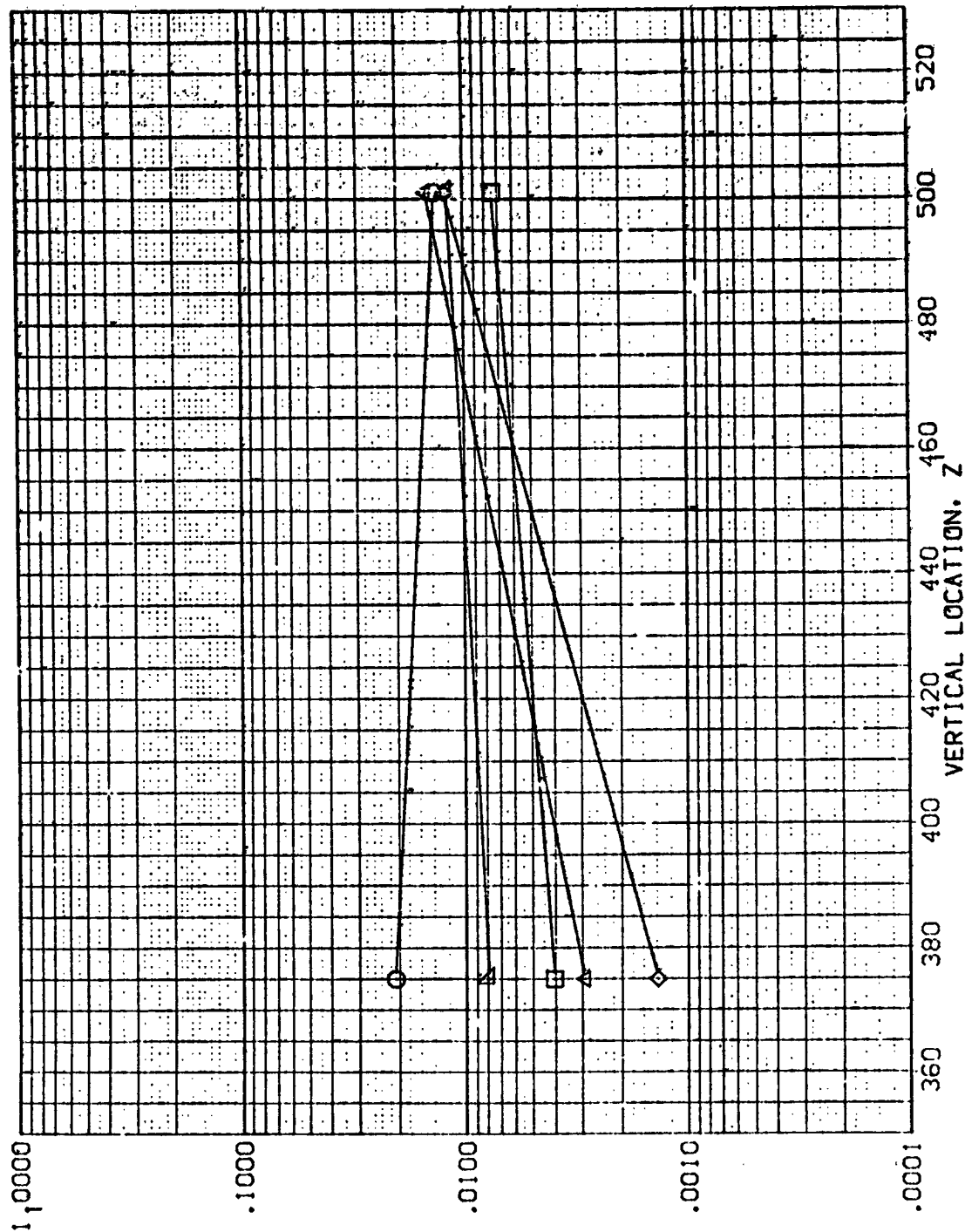


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 X/L = .700



DATA SET SYMBOL  
 (RE 1021)  
 (RE 1022)  
 (RE 1023)  
 (RE 1024)  
 (RE 1025)

CONFIGURATION DESCRIPTION  
 ASES 3.5-195 BODY SIDEWALL  
 ASES 3.5-195 BODY SIDEWALL  
 ASES 3.5-195 BODY SIDEWALL  
 ASES 3.5-195 BODY SIDEWALL  
 ASES 3.5-195 BODY SIDEWALL

ALPHA BETA X/L  
 .000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

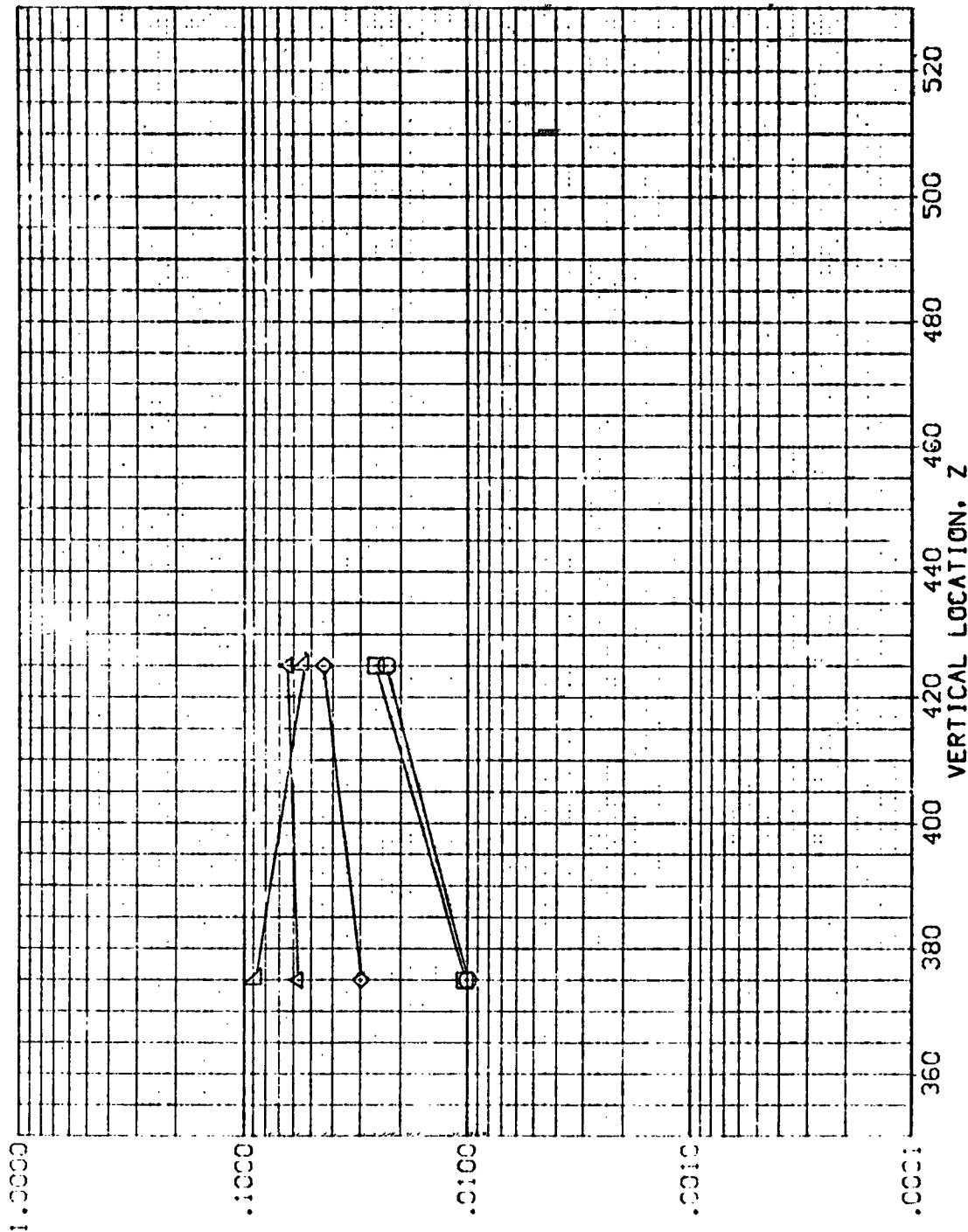


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MAC = 5.300  $WAW/HT = .900$   $X/L = .300$

DATA SET SYMBOL  
 (REV19)  
 (REV27)  
 (REV26)  
 (REV25)  
 (REV24)

CONFIGURATION DESCRIPTION  
 AXES 3.5-195 1428 01 BODY SIDEWALL  
 AXES 3.5-195 1428 01 BODY SIDEWALL  
 AXES 3.5-195 1428 01 BODY SIDEWALL  
 AXES 3.5-195 1428 01 BODY SIDEWALL  
 AXES 3.5-195 1428 01 BODY SIDEWALL

ALPHA  
 .000  
 -30.000  
 -60.000  
 -90.000  
 -120.000

BETA  
 .000  
 .000  
 .000  
 .000  
 .000

PN/L  
 1.000  
 1.000  
 1.000  
 1.000  
 1.000

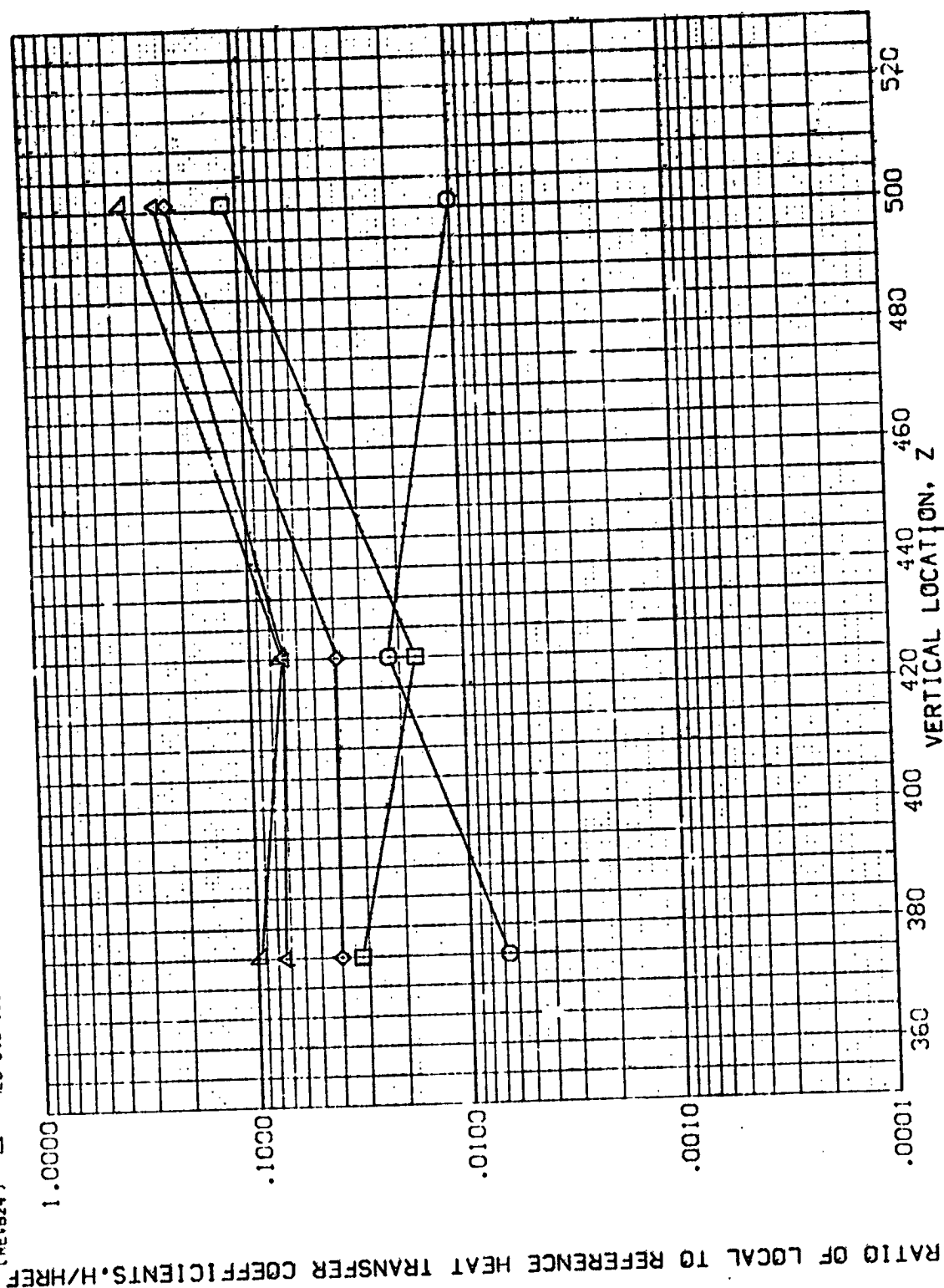


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 X/L = .400

12

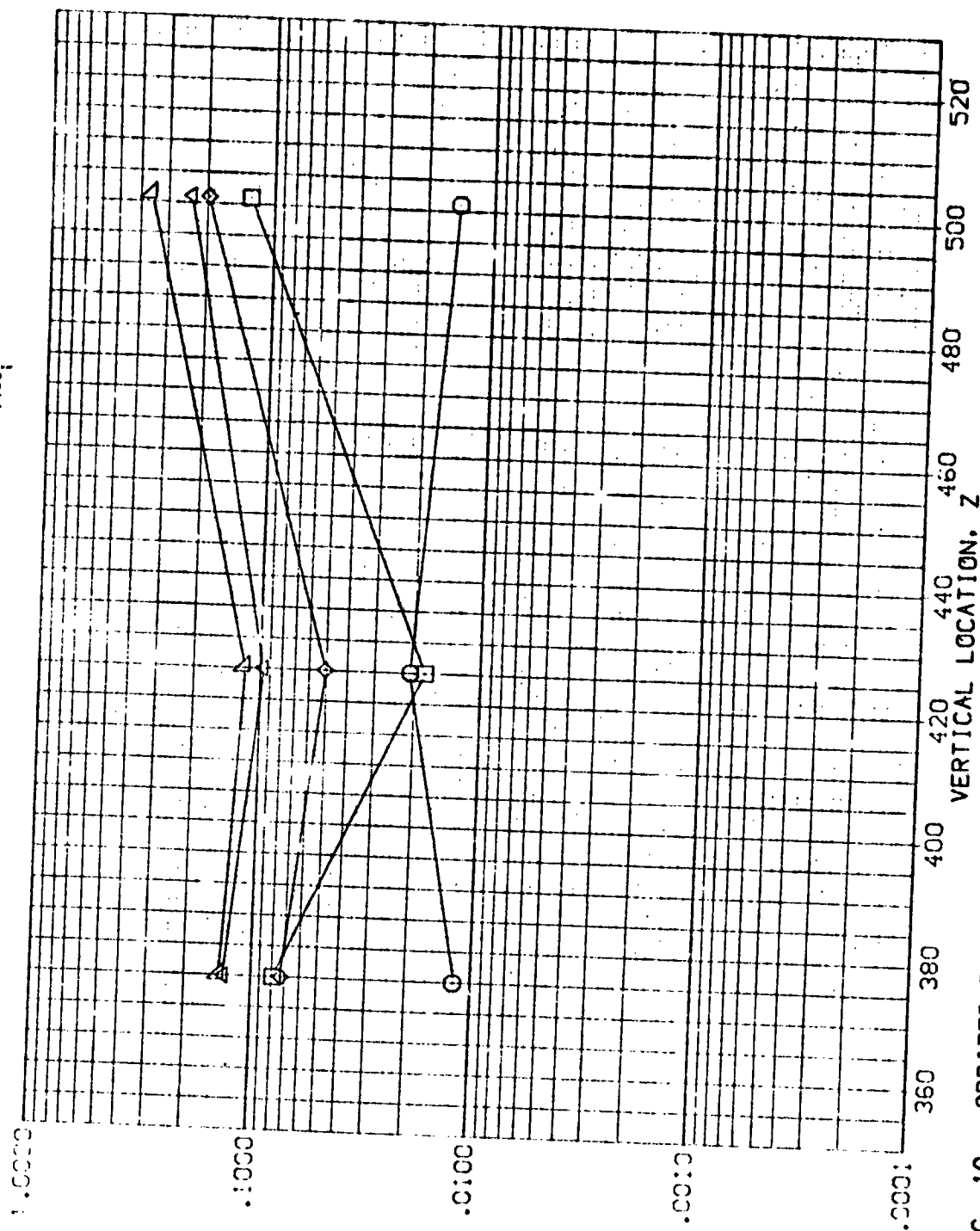


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

$$MACF = 5.333 \quad \text{HAW/HT} = .906 \quad X/L = .500$$

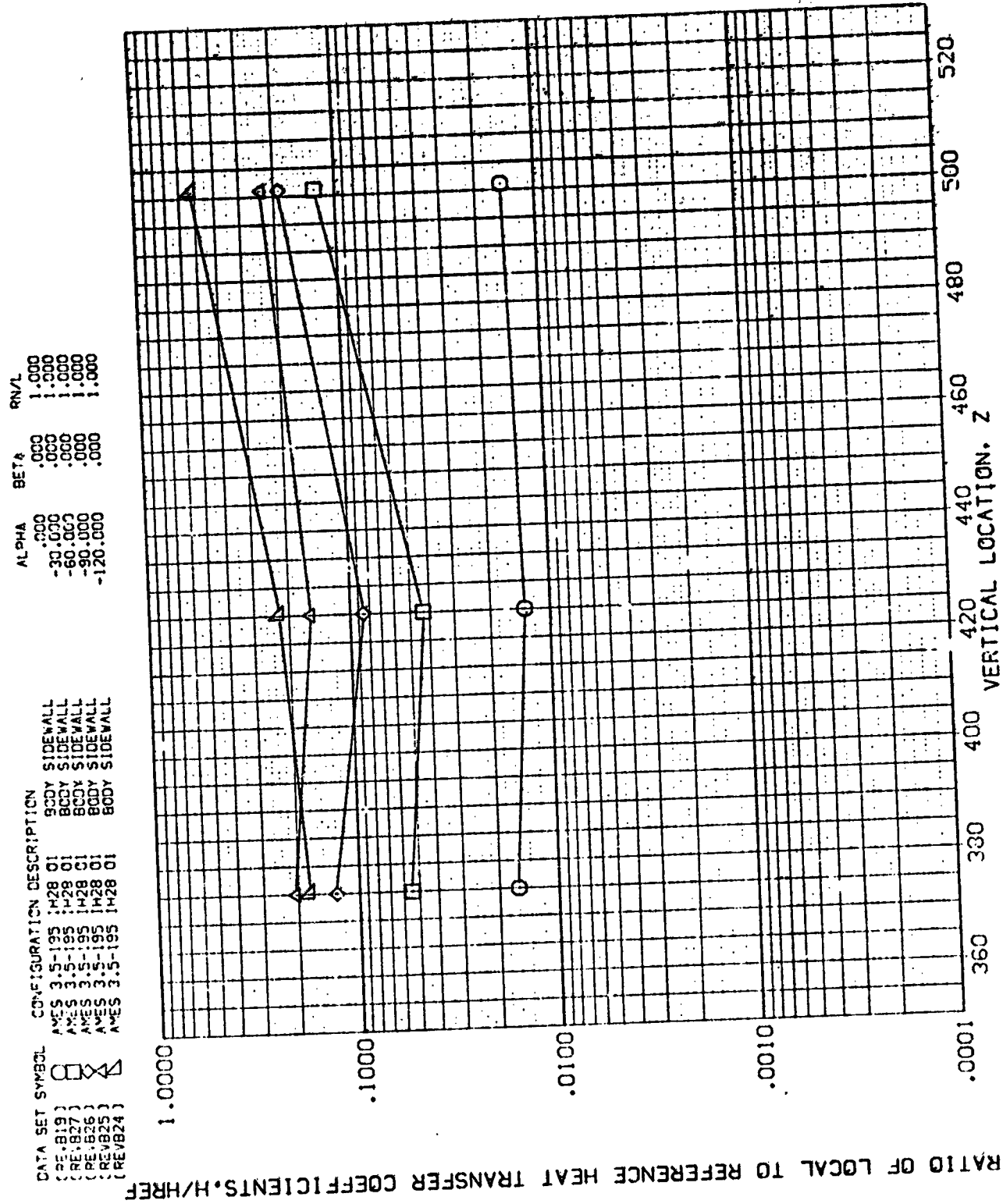


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300       $h^*W/HT = .900$        $X/L = .600$

DATA SET SYMBOL  
(REV 19)  
(REV 27)  
(REV 28)  
(REV 29)  
(REV 30)  
(REV 31)

CONFIGURATION DESCRIPTION  
ACES 3.5-195 1428 C1  
ACES 3.5-195 1428 C1  
ACES 3.5-195 1428 C1  
ACES 3.5-195 1428 C1  
ACES 3.5-195 1428 C1  
ACES 3.5-195 1428 C1

ALPHA BETA PW/L  
-100.000  
-30.000  
-50.000  
-60.000  
-70.000  
-80.000  
-90.000  
-100.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

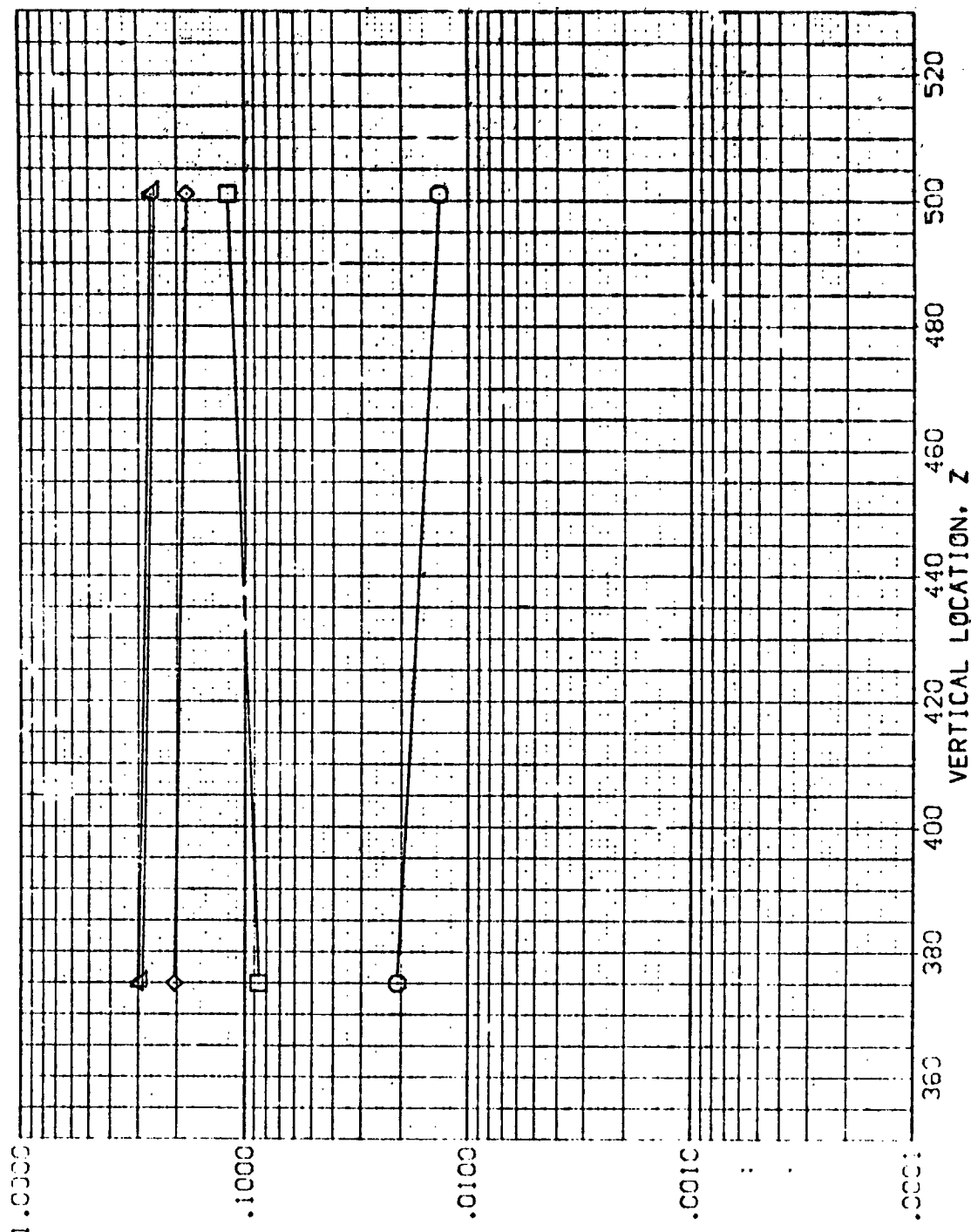


FIG. 10 ORBITER BODY SIDEWALL, ORBITER ALONE

MACH = 5.300 HAW/HT = .900 X/L = .700

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV B01)

SYMBOL HAW/H<sub>REF</sub> Z MACH  
 ◊ .853 375.000 3.228  
 ◻ .902  
 ◻ 1.000

PARAMETRIC VALUES  
 .000 BETA  
 1.000  
 .000 ALPHA  
 RN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

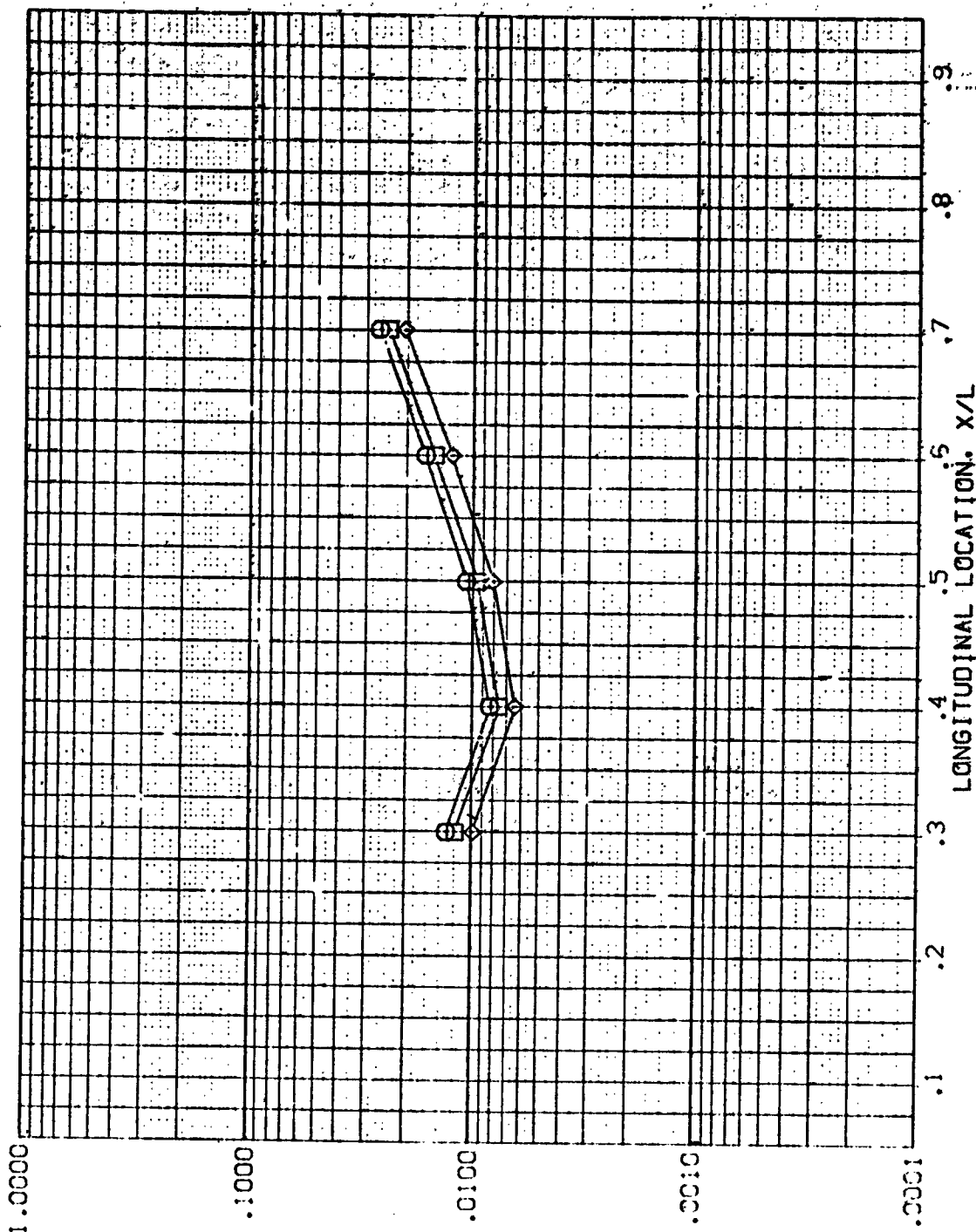


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB01)

CASE NO. 1850  
 MACH 5.228  
 Z 425.000  
 HREF 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 RAYL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

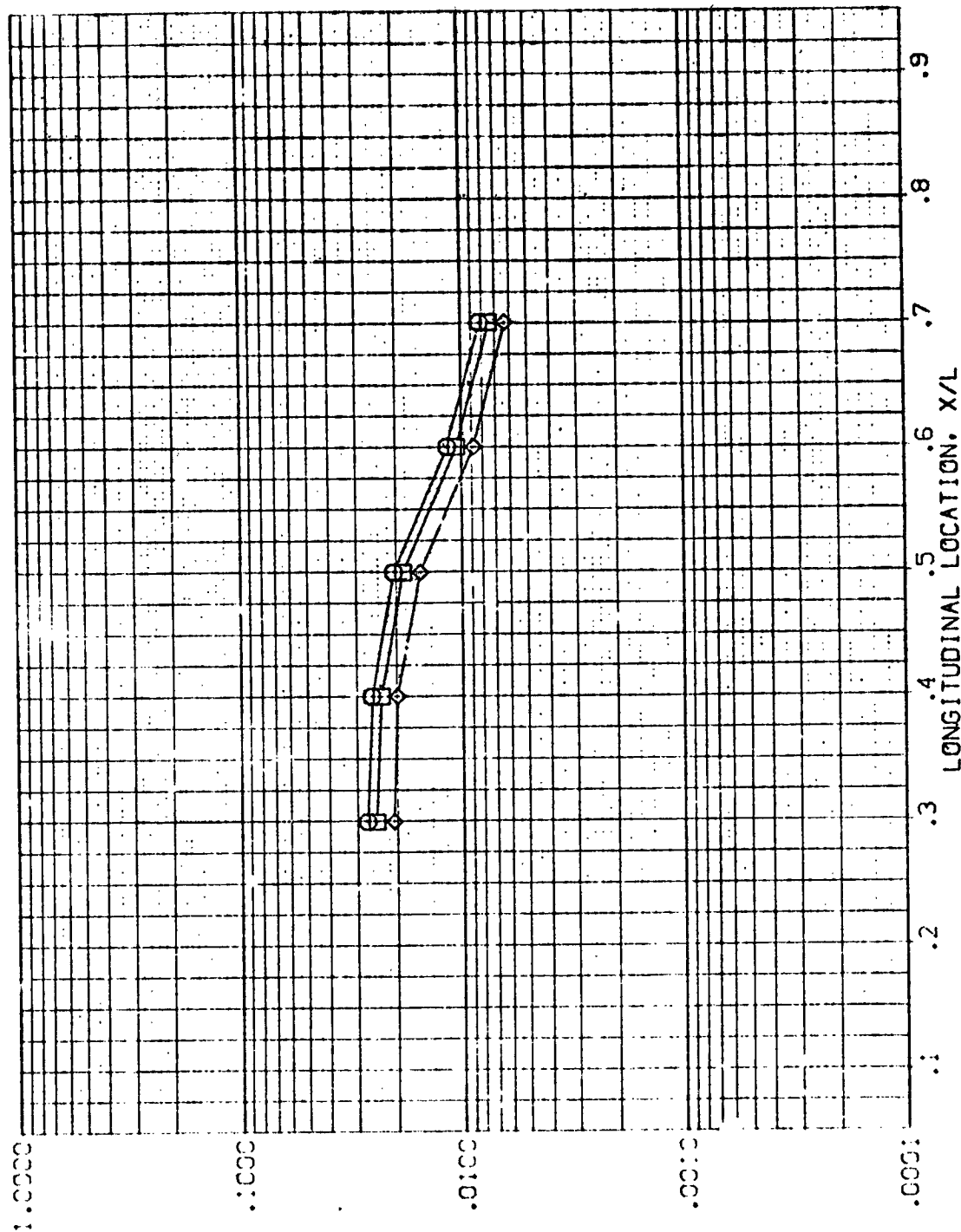


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+71 BODY SIDEWALL

(REVBO1)

PARAMETRIC VALUES	
.000	BETA
1.000	

SYMBOL	TAW/WT	Z	MACH
◇	.000	501.000	5.228
□	.000		
○	.950		

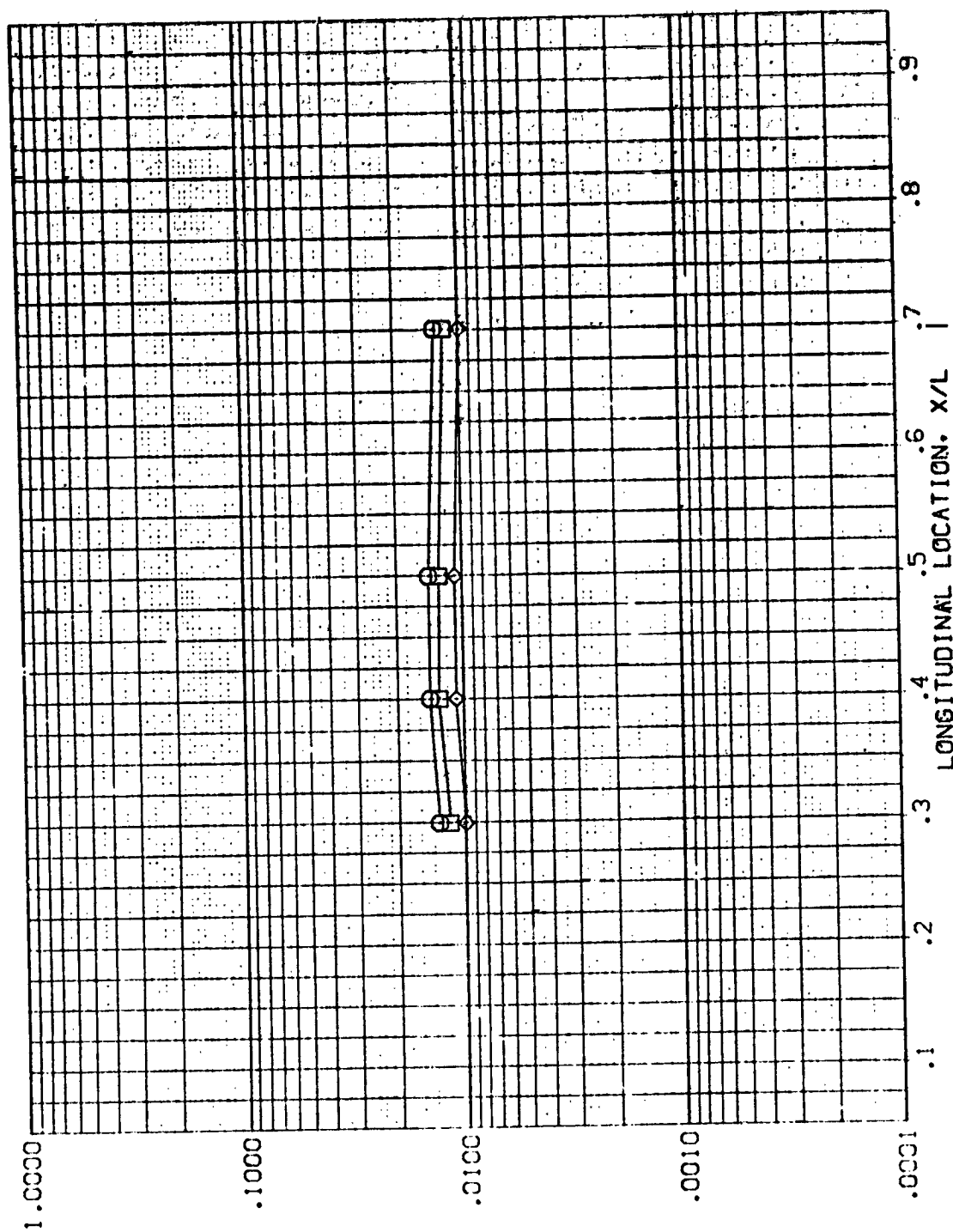
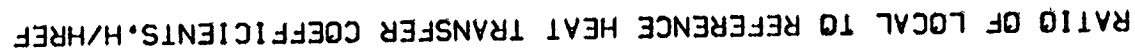


FIG. 1. ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK.



# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB02)

SYMBOL HAV/HT Z MACH  
 □ .850 375.000 5.219  
 ○ .900 1.000  
 ◇ 1.000

PARAMETRIC VALUES  
 ALF 20.000 BETA .000  
 PNU 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

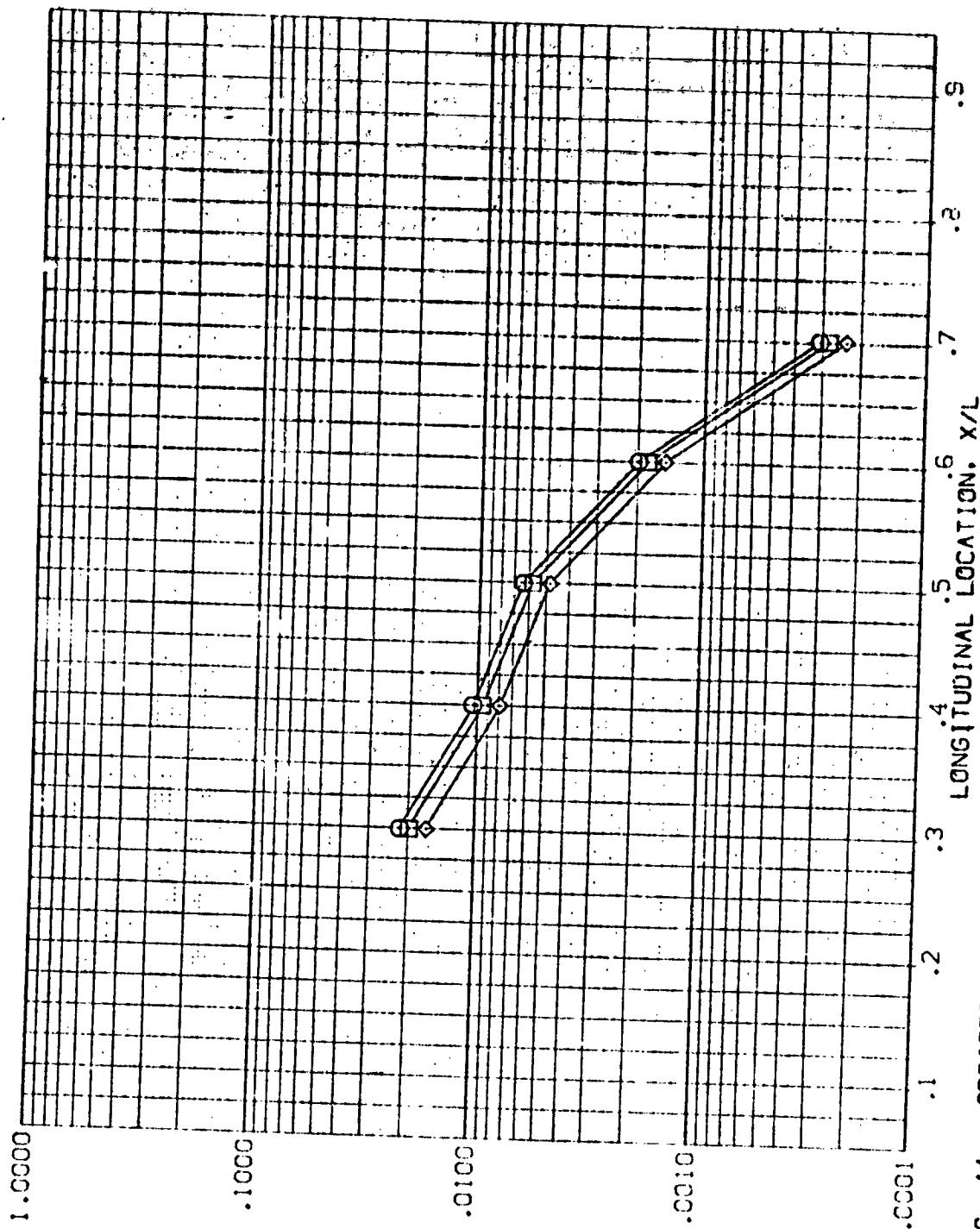


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

REPRODUCIBILITY OF THE  
 ORIGINAL DATA IS  
 GUARANTEED

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV802)

SYNOPSIS  
 WAVE/HT .850  
 .900  
 1.000  
 Z 425.000  
 VAC 5.219

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 P/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

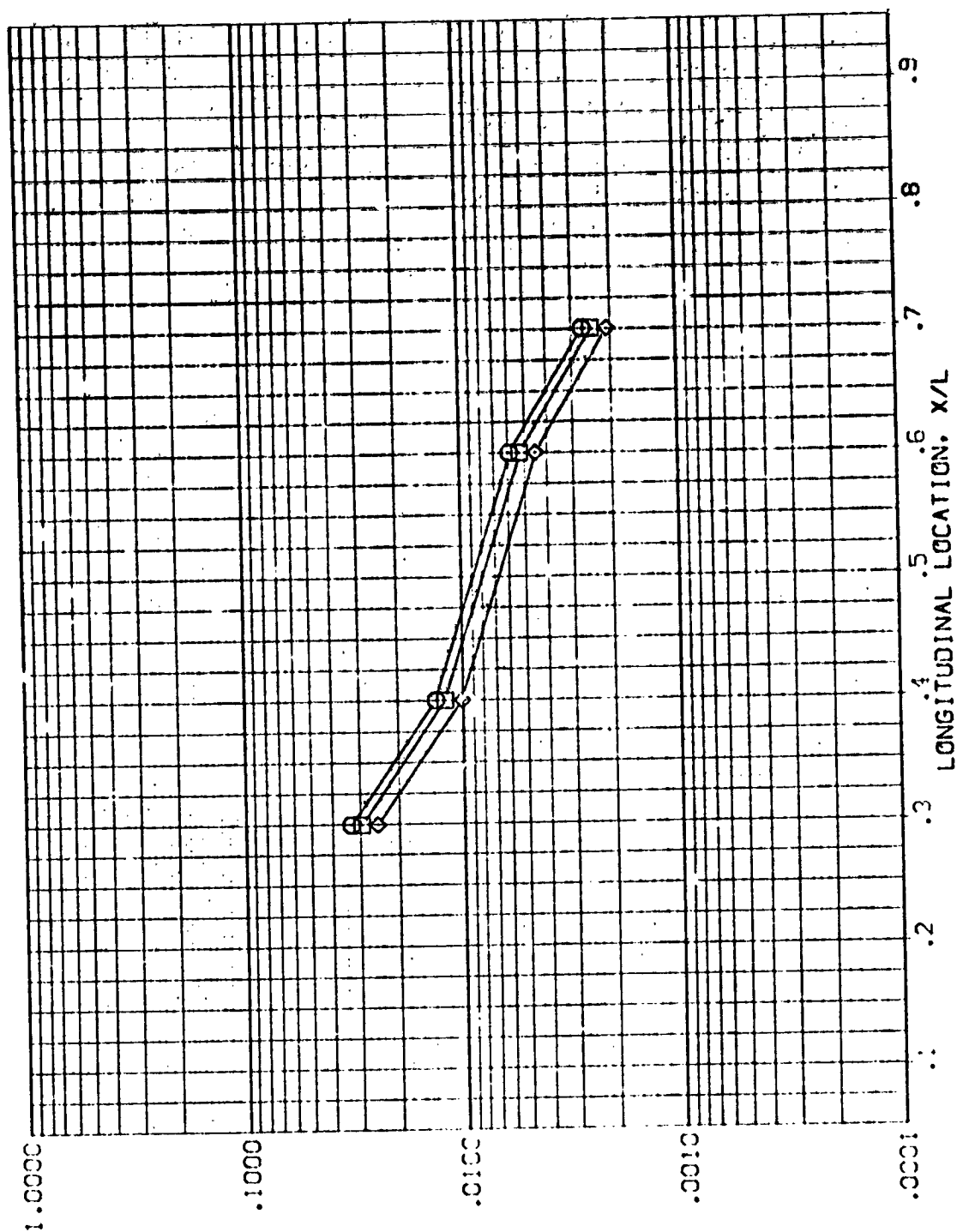


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1428 01-T1 BODY SIDEWALL

(REVERSED)

SYMBOL HAW/HT Z MACH  
 ◇ .850 501.000 5.219  
 ○ .900  
 □ 1.000

PARAMETRIC VALUES  
 20.000 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

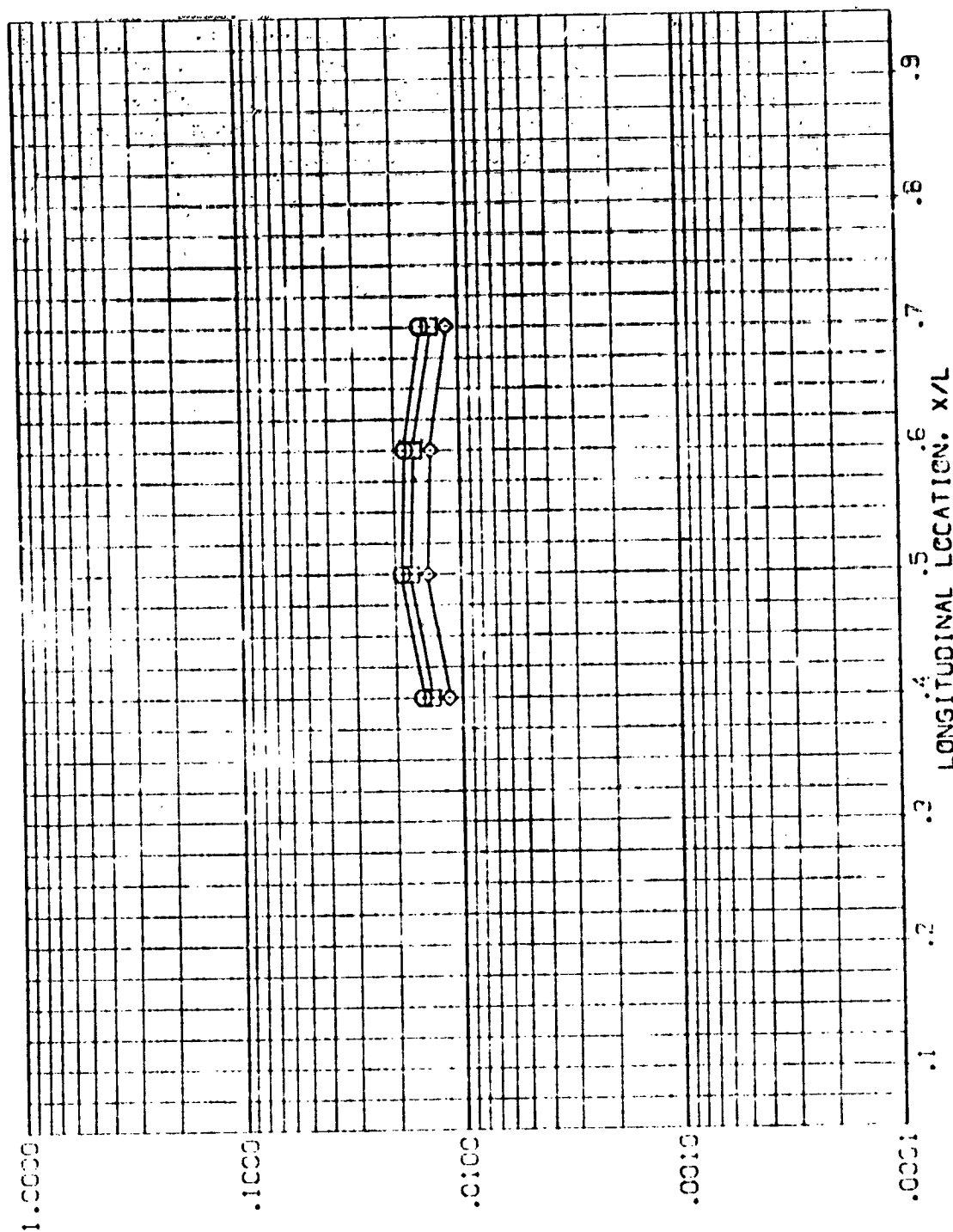


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

3345

Symbol	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st	32nd	33rd	34th	35th	36th	37th	38th	39th	40th	41st	42nd	43rd	44th	45th	46th	47th	48th	49th	50th	51st	52nd	53rd	54th	55th	56th	57th	58th	59th	60th	61st	62nd	63rd	64th	65th	66th	67th	68th	69th	70th	71st	72nd	73rd	74th	75th	76th	77th	78th	79th	80th	81st	82nd	83rd	84th	85th	86th	87th	88th	89th	90th	91st	92nd	93rd	94th	95th	96th	97th	98th	99th	100th
Symbol	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st	32nd	33rd	34th	35th	36th	37th	38th	39th	40th	41st	42nd	43rd	44th	45th	46th	47th	48th	49th	50th	51st	52nd	53rd	54th	55th	56th	57th	58th	59th	60th	61st	62nd	63rd	64th	65th	66th	67th	68th	69th	70th	71st	72nd	73rd	74th	75th	76th	77th	78th	79th	80th	81st	82nd	83rd	84th	85th	86th	87th	88th	89th	90th	91st	92nd	93rd	94th	95th	96th	97th	98th	99th	100th

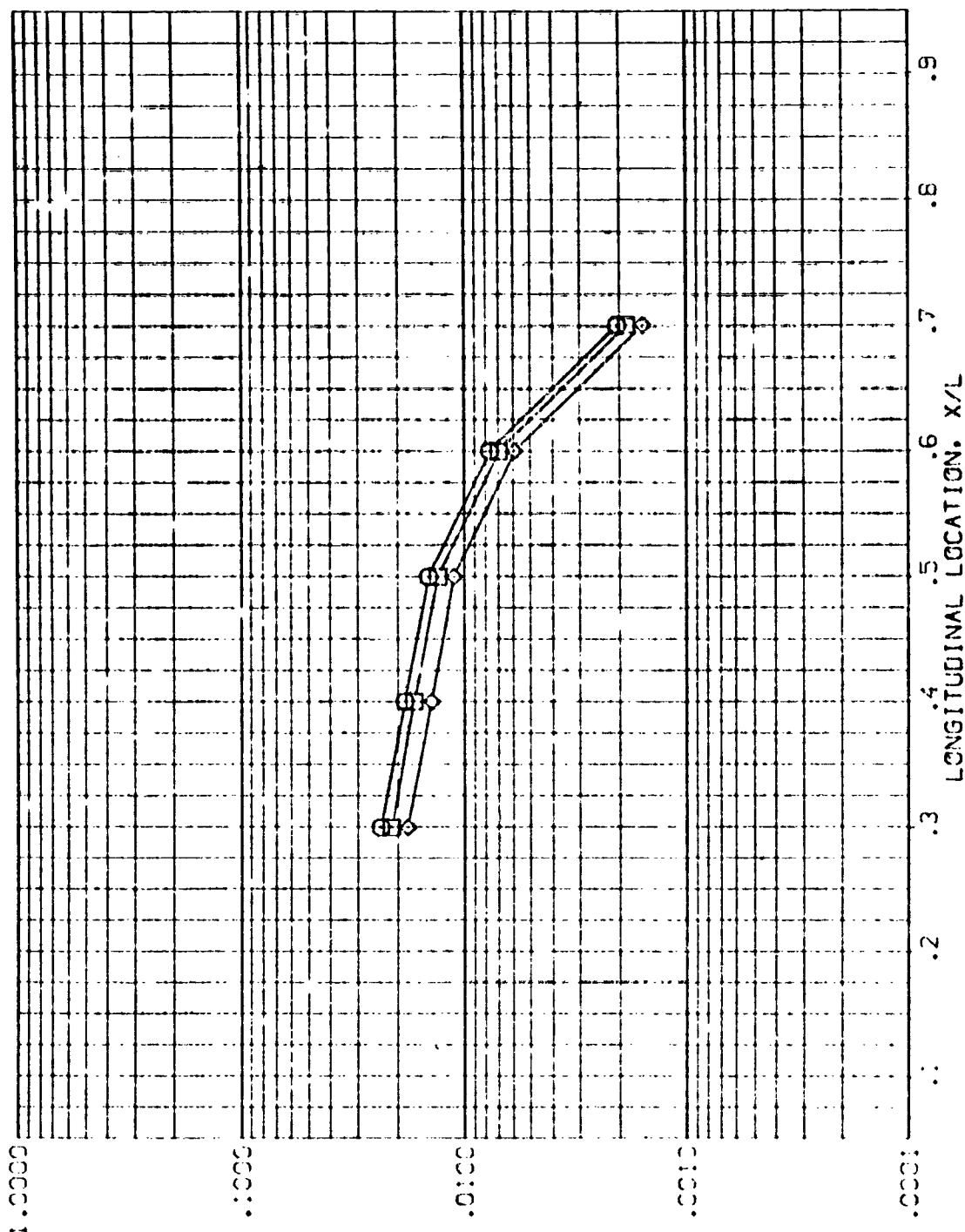
RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$ 

FIG. 11. ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL  
 (REV B03)  
 PARAMETRIC VALUES  
 ALPHA 60.0°  
 BETA 1.0°  
 MACH 5.220  
 Z 425.000  
 HAW/HT .850  
 .900  
 1.000  
 SYMBOL  $\diamond$   $\square$

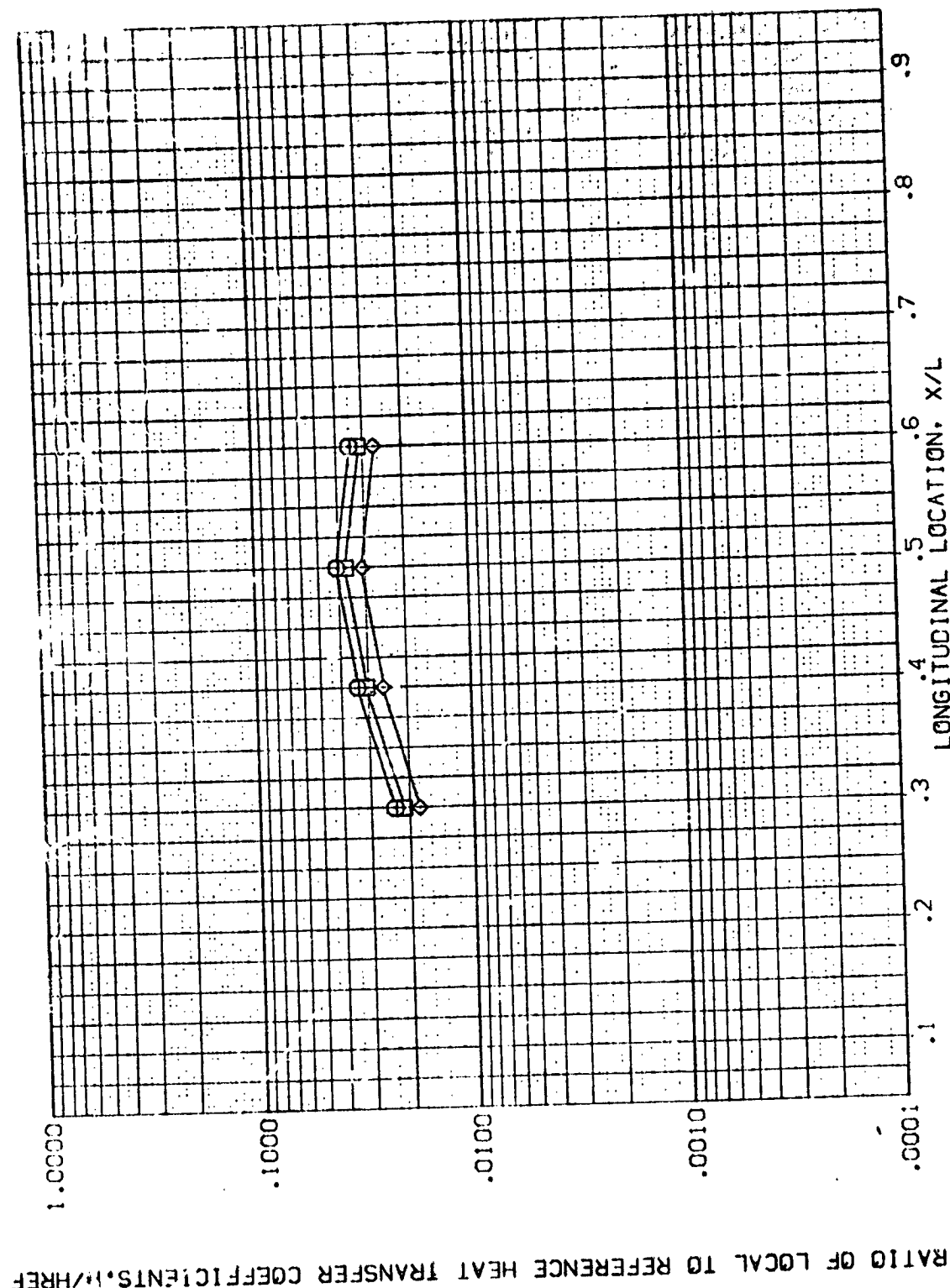


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB03)

SYMBOL	HAW/HT	Z	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA 1.000
◇	.850	501.000	5.220	60.000	.000
□	.900			1.000	
○	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

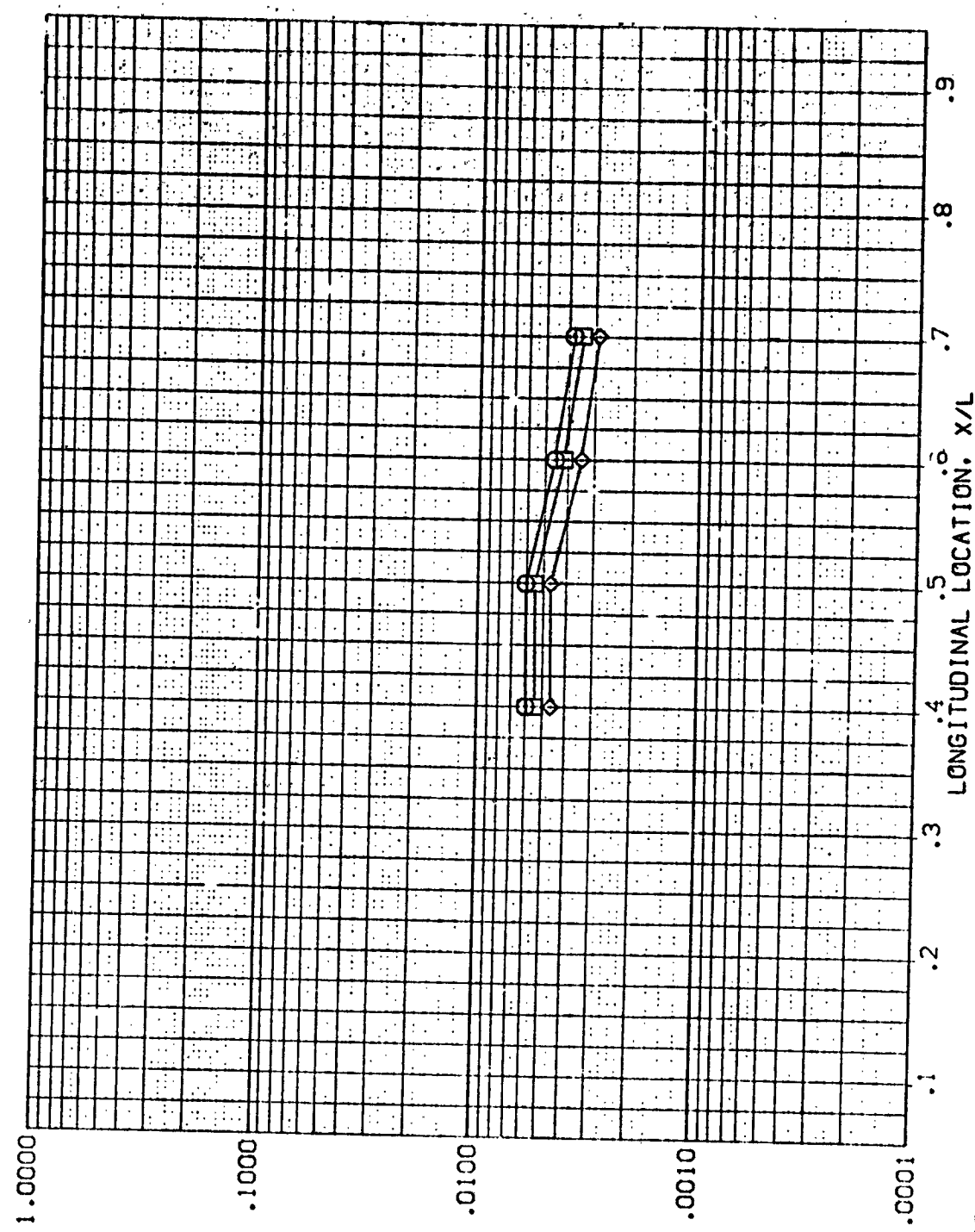


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REV804)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL

HAW/H<sub>T</sub>

Z

MACH

5.213

375.000

.050

.900

1.000

PARAMETRIC VALUES

90.000

BETA

.000

1.000

ALPHA

RN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

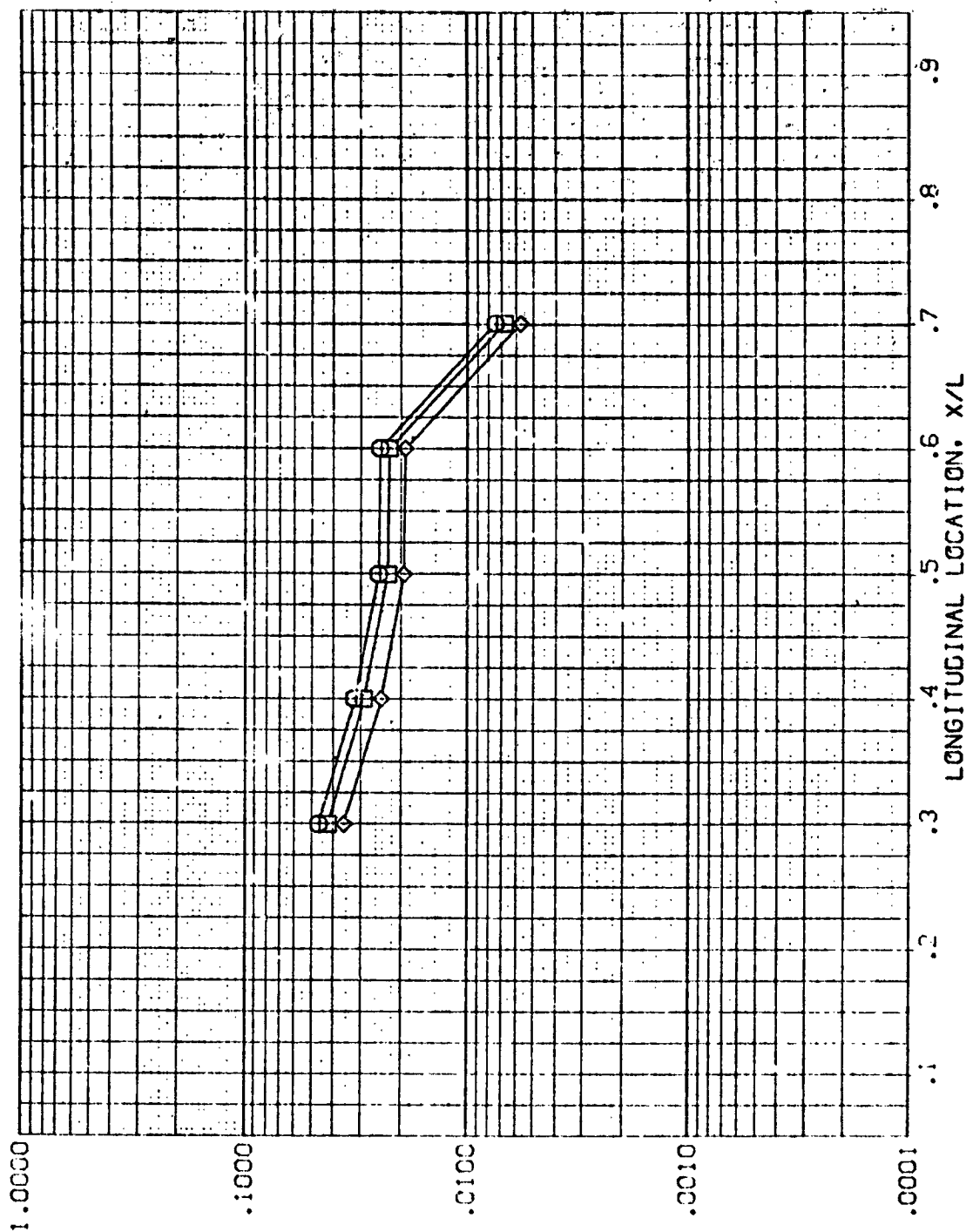


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF TIE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV204)

SYMBOL HAW/HT Z MACH  
 □ .850 425.000 5.219  
 ◇ .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 90.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

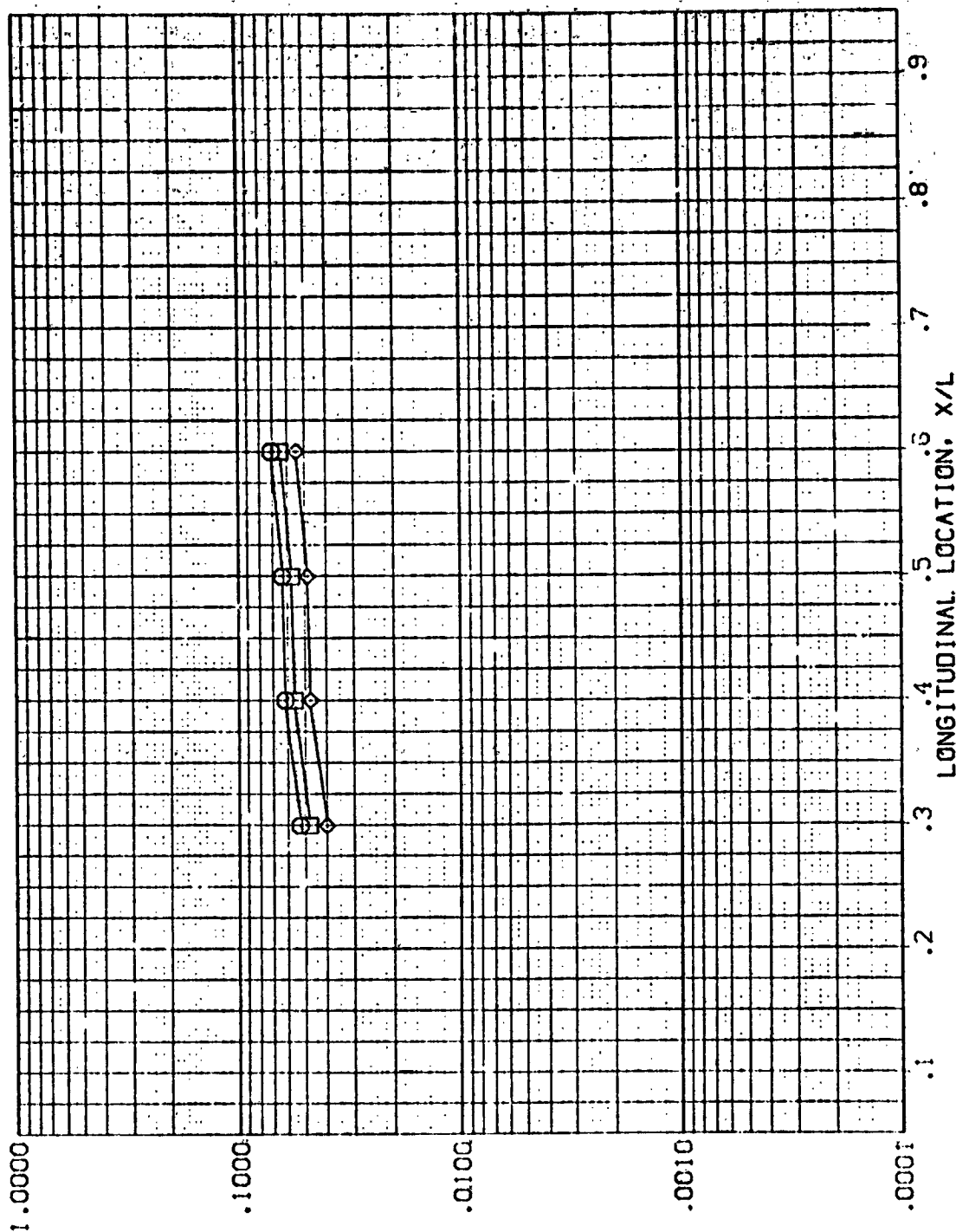


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



SYMBOL  $H^*/H^*$  Z MACH  
 $\diamond$  .852 501.000 5.219  
 $\square$  .900  
 $\triangle$  1.000

PARAMETRIC VALUES  
 ALPHA 90.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

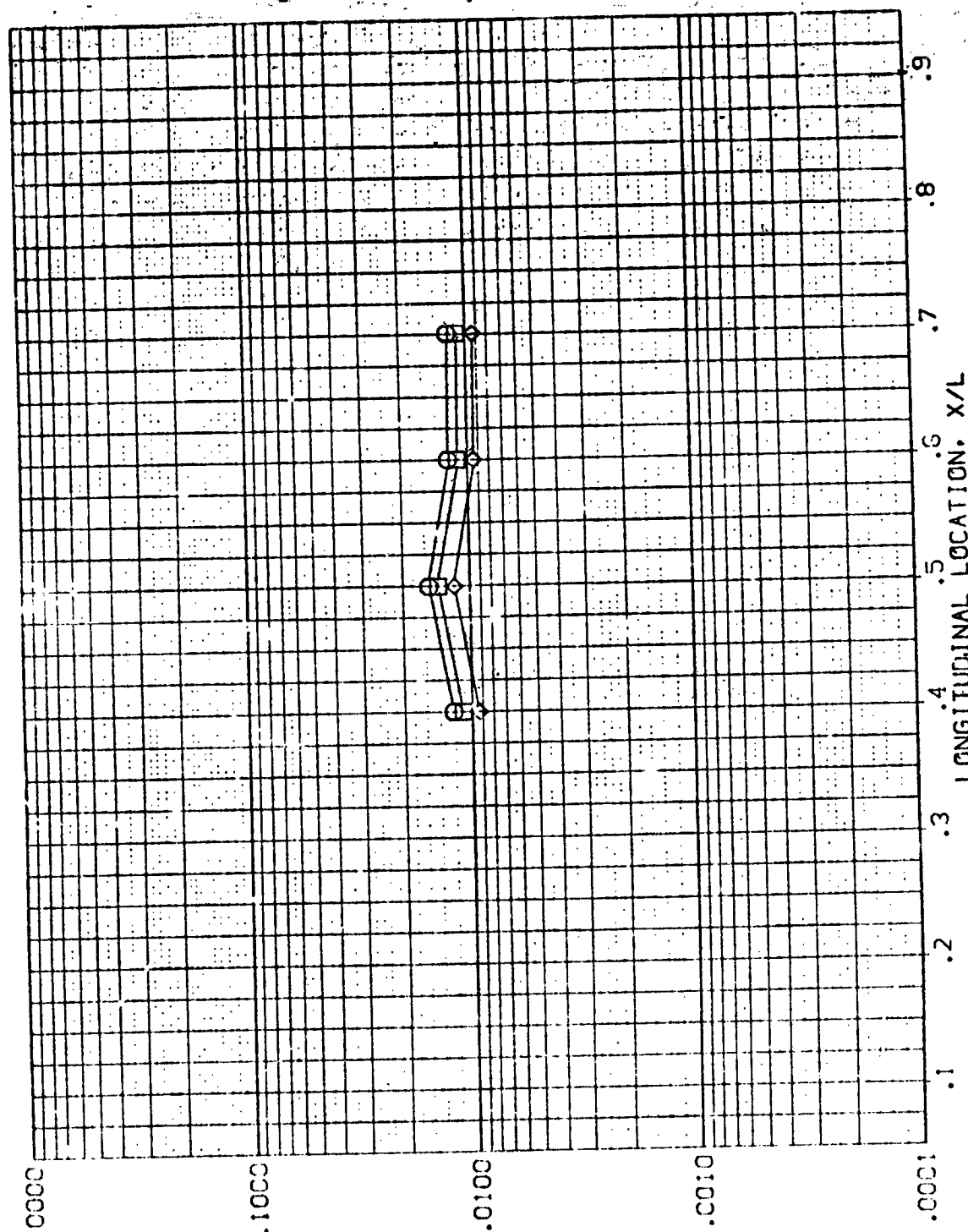


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV805)

SYNOPSIS			PARAMETRIC VALUES		
HA/WT	Z	MACH	ALPHA	120.C.U	BETA
.850	375.000	5.220	RN/L	1.000	.000
.900					
1.000					

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

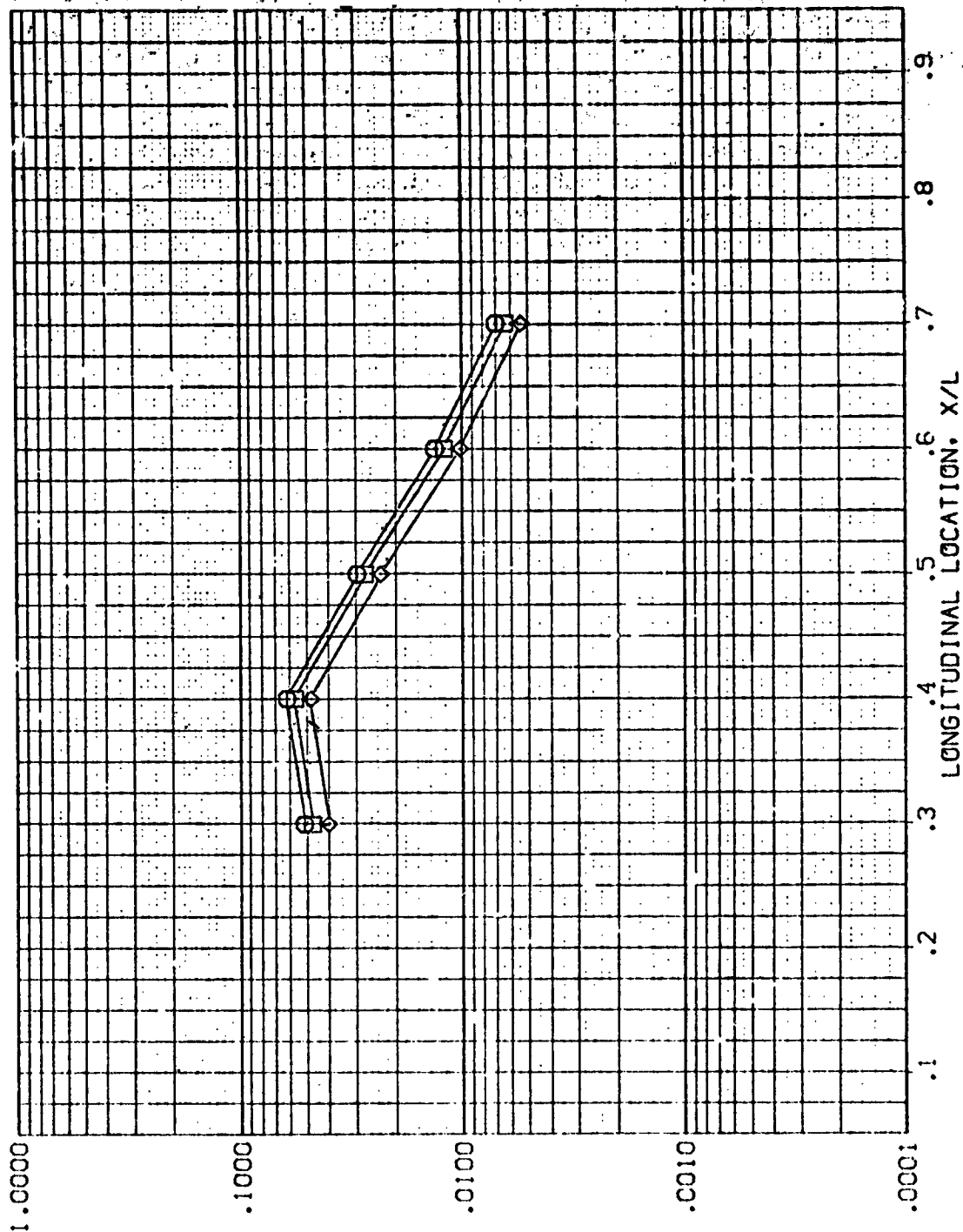


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-105 IH28 01+T1 BODY SIDEWALL

(REVB05)

SWRCL HAW/WT Z MACH  
 .850 425.000 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 120.000 BETA .000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

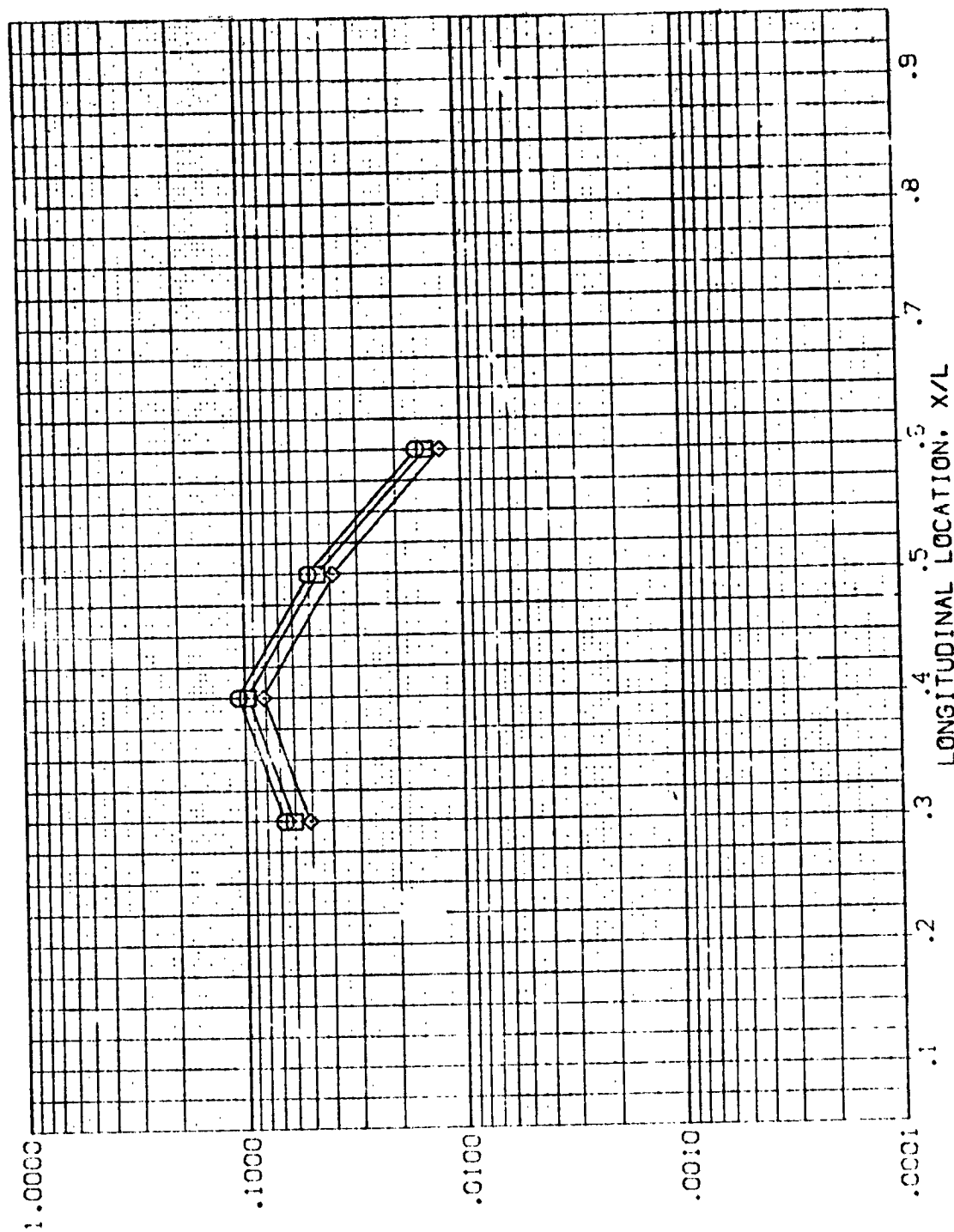


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB05)

SYMBOL HAW/HY Z MACH  
 .85C .501.000 5.220  
 .90C  
 1.00C

PARAMETRIC VALUES  
 ALPHA BETA  
 RN/L 1.00J .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

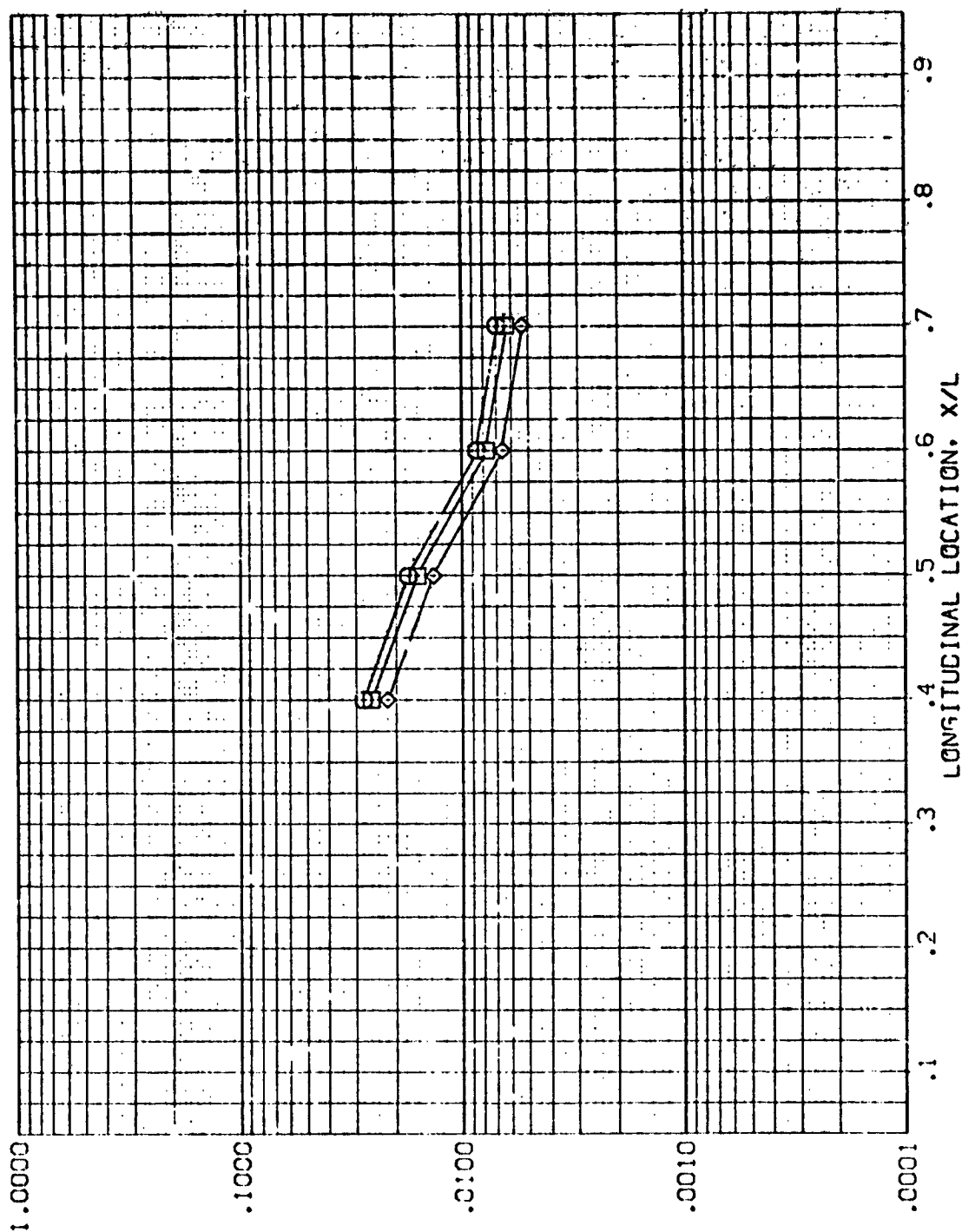


FIG. 11, ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV906)

SYMBOL

HA\*AT 2

MACH 5.220

375.000

.651

.900

1.000

PARAMETRIC VALUES

ALPHA -120.000

BETA 1.000

900

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

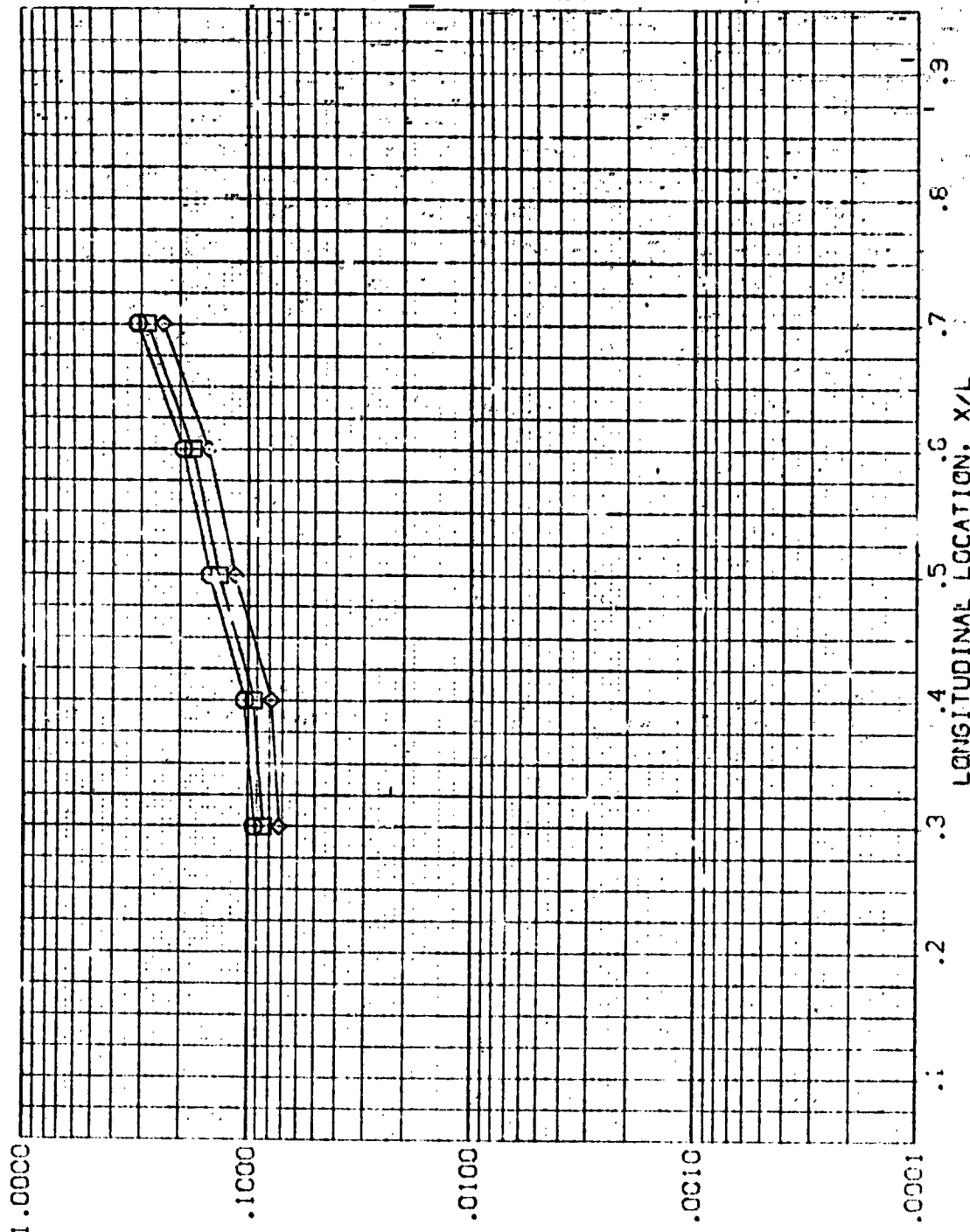


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF TIE TANK

AMES 3.5-195 1428 01+T1 BODY SIDEWALL

(REVB06)

SYMBOL	hA/h <sub>REF</sub>	Z	MACH	PARAMETRIC VALUES
◇	.850	425.000	5.220	ALPHA -120.000
□	.900			BETA 1.000
◇	1.000			RV/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, h/h<sub>REF</sub>

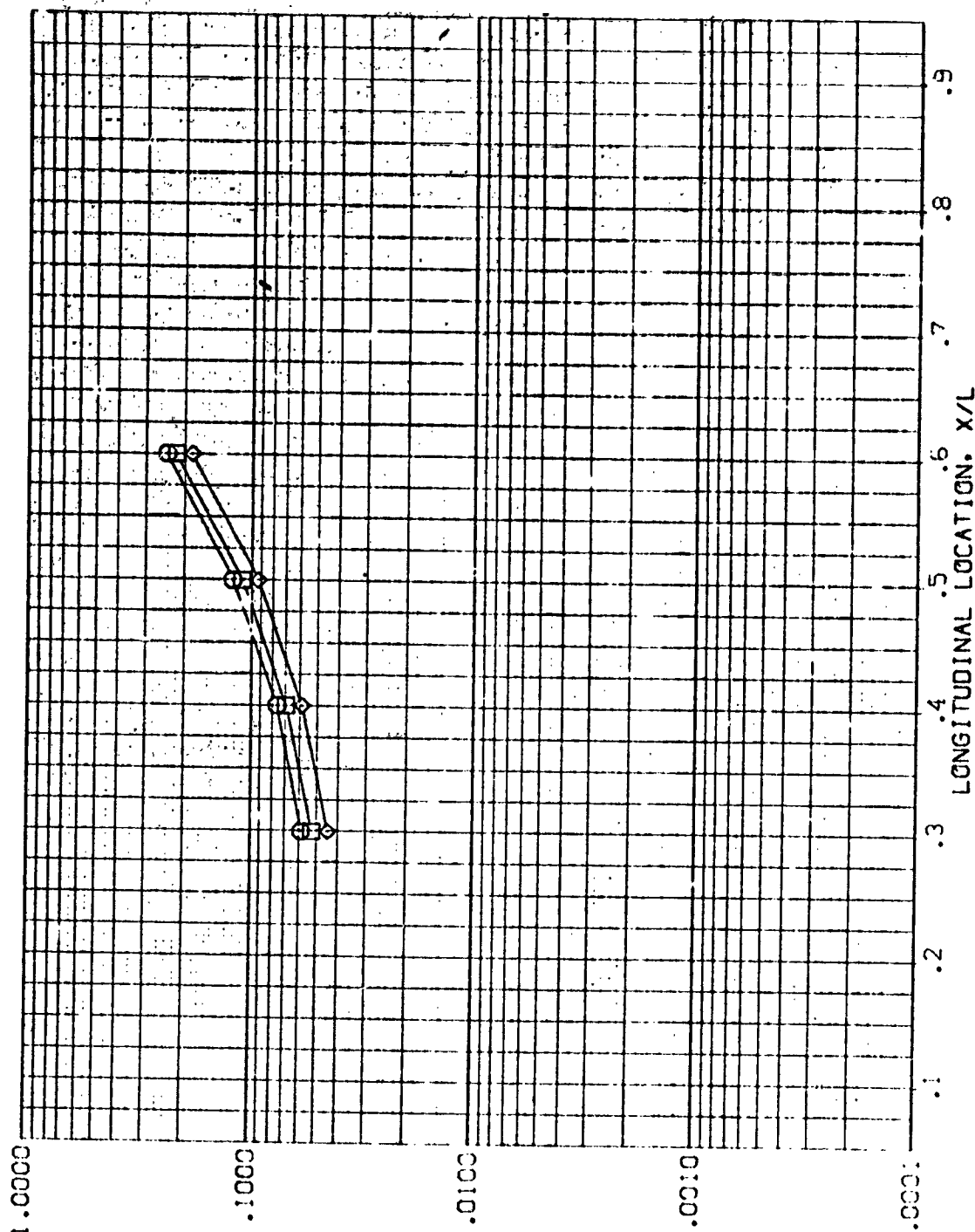


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVISED)

SYMBOL HAW/HT Z MACH  
 .850 501.000 5.220  
 .900  
 1.000

DESIGN VALUES  
 ALPHA -100.000  
 BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

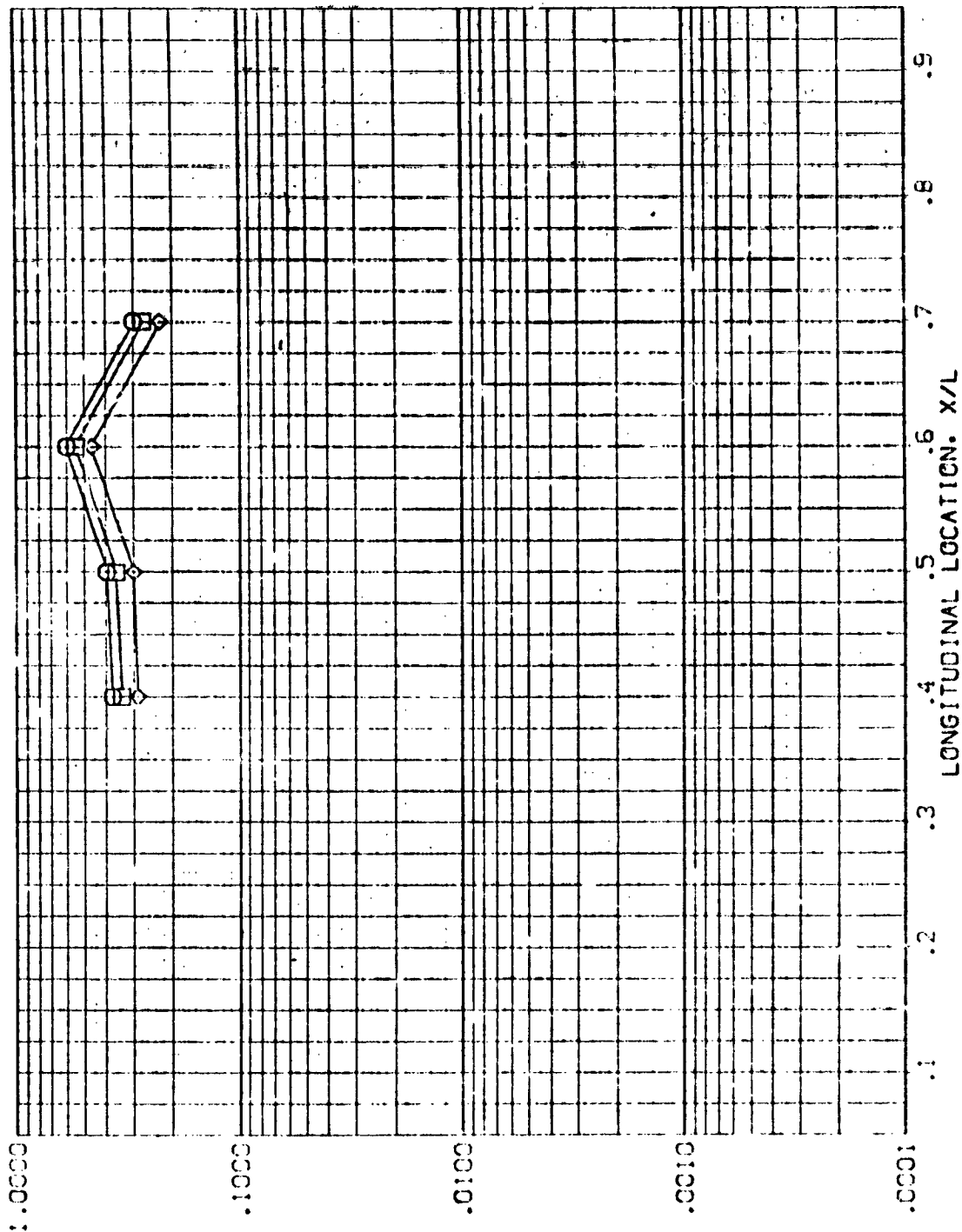


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV307)

PARAMETRIC VALUES  
 -90.000 BETA .000  
 ALPHA  
 RV/L 1.000

SYMBOL HAW/HIT Z MACH  
 .850 375.000 5.219  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

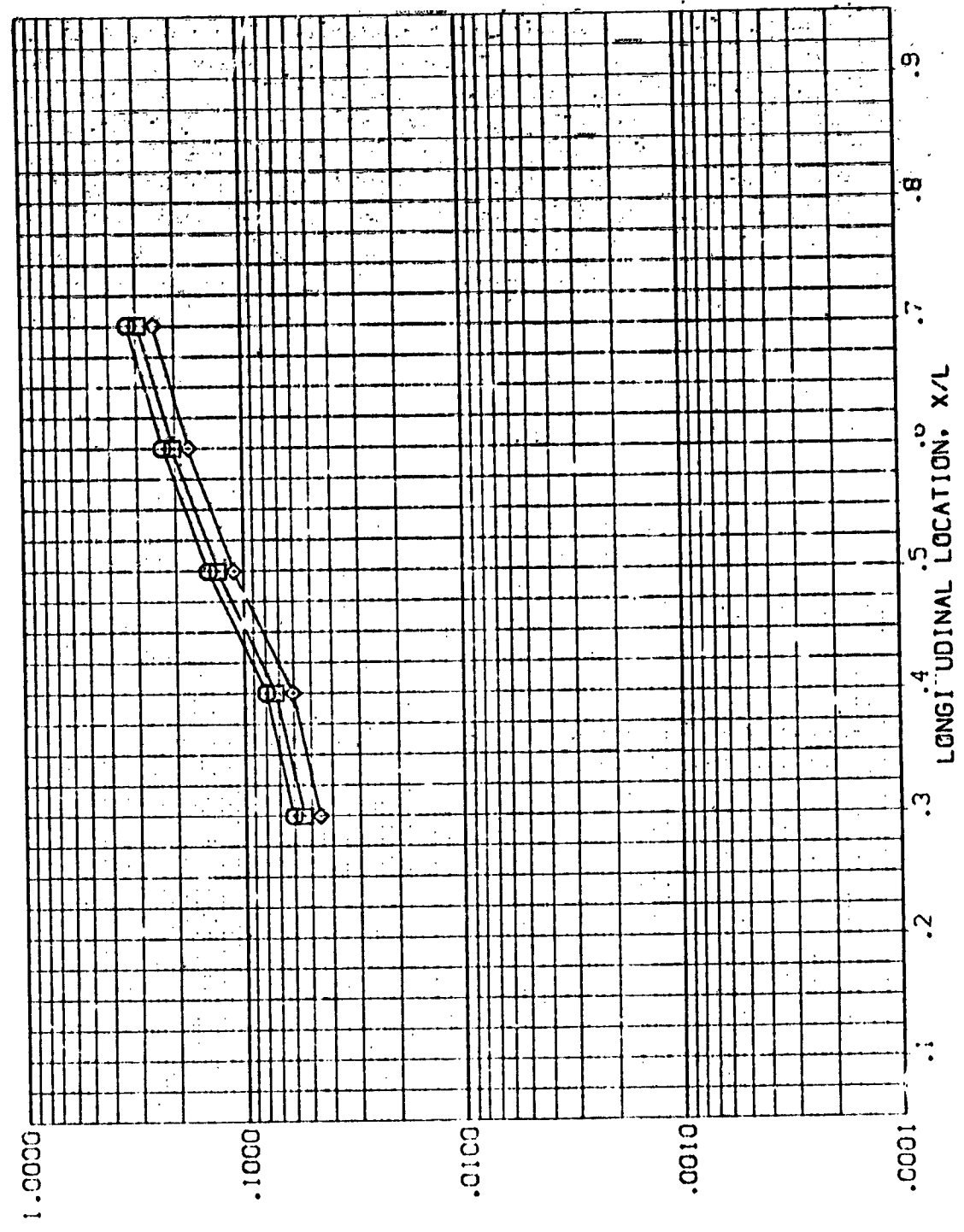


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



# AMES 3.5-195 IH28 C1+T1 BODY SIDEWALL

(REVERSED)

PAGE 548

ALPHA  
BETA  
GAMMA

SYMBOL HAW/HT Z MACH  
.852 425.000 5.219  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

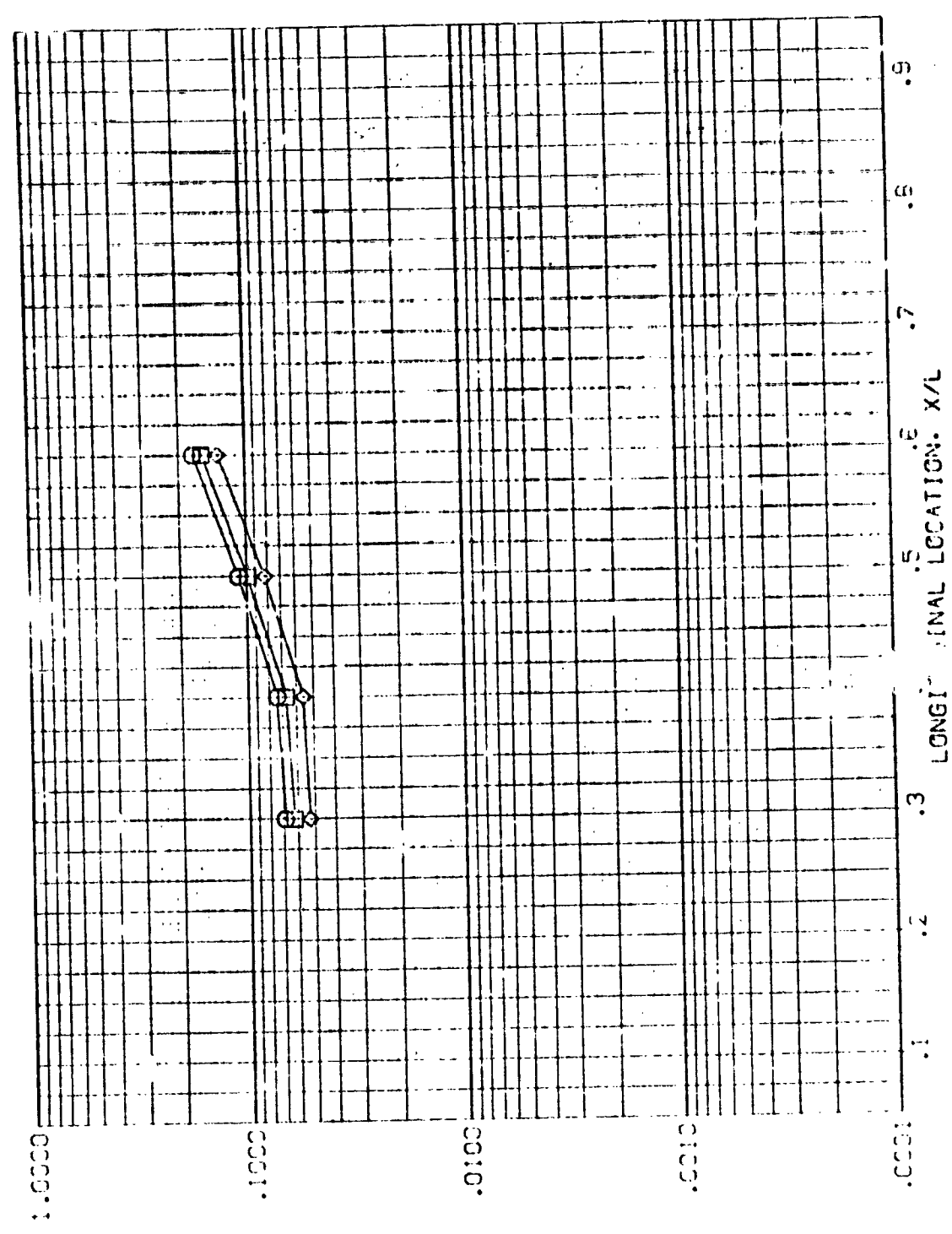


FIG. 11 ORBITER BODY SIDEWALL, OR. PR IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB07)

SYMBOL	HEIGHT	Z	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
				RN/L	
◇	.850	501.000	5.219	-90.000	.000
□	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

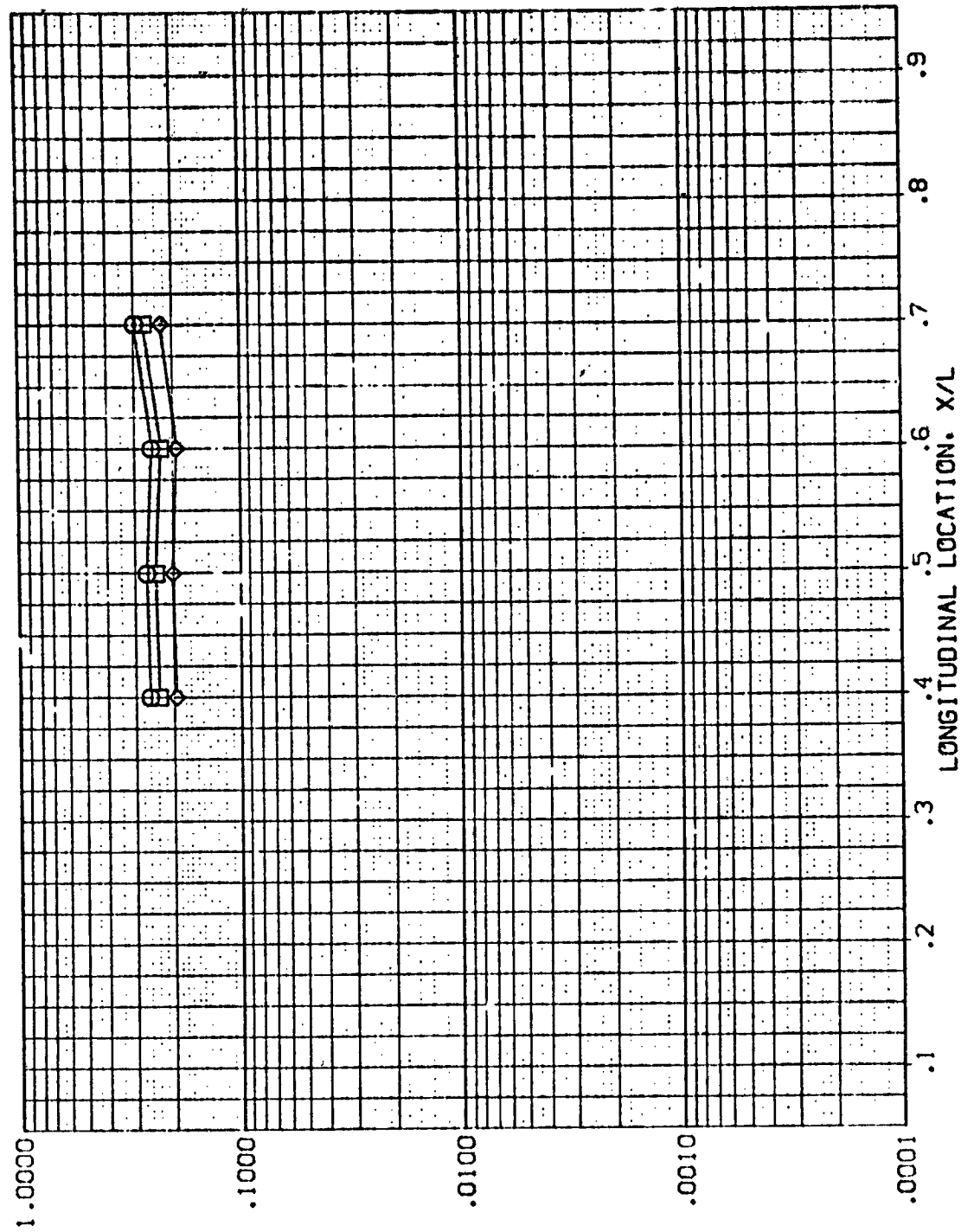


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

PARAMETRIC VALUES  
ALPHA -60.000 BETA .300  
RN/L 1.000

SYMBOL HAW/HT Z MACH  
◇ .850 375.000 5.220  
□ .900  
○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

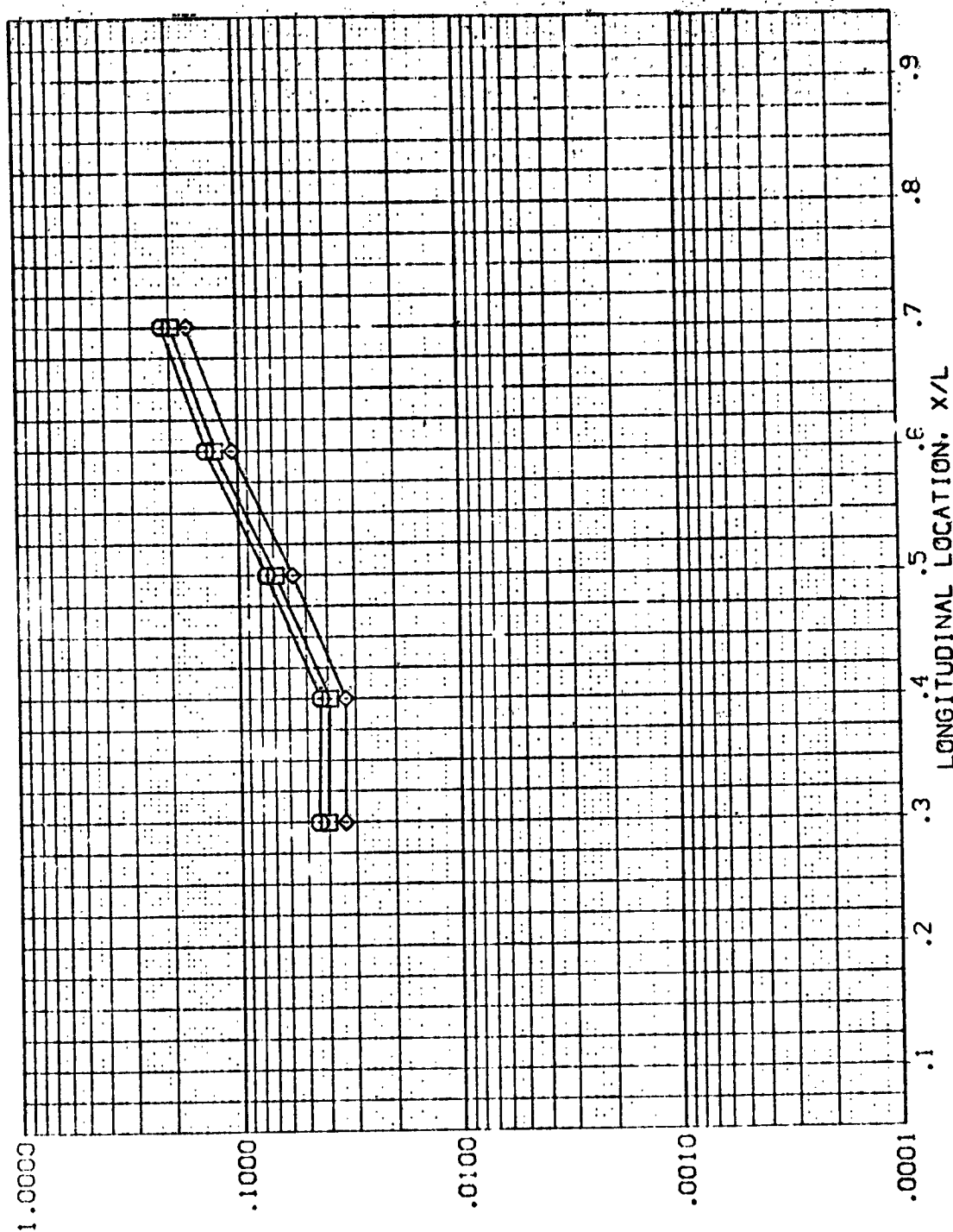


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB08)

PARAMETRIC VALUES  
 ALPHA -60.080  
 BETA 1.000  
 RH/L .000

SYMBOL HAV/HT Z MACH  
 □ .850 425.000 5.220  
 ◇ .900  
 ◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

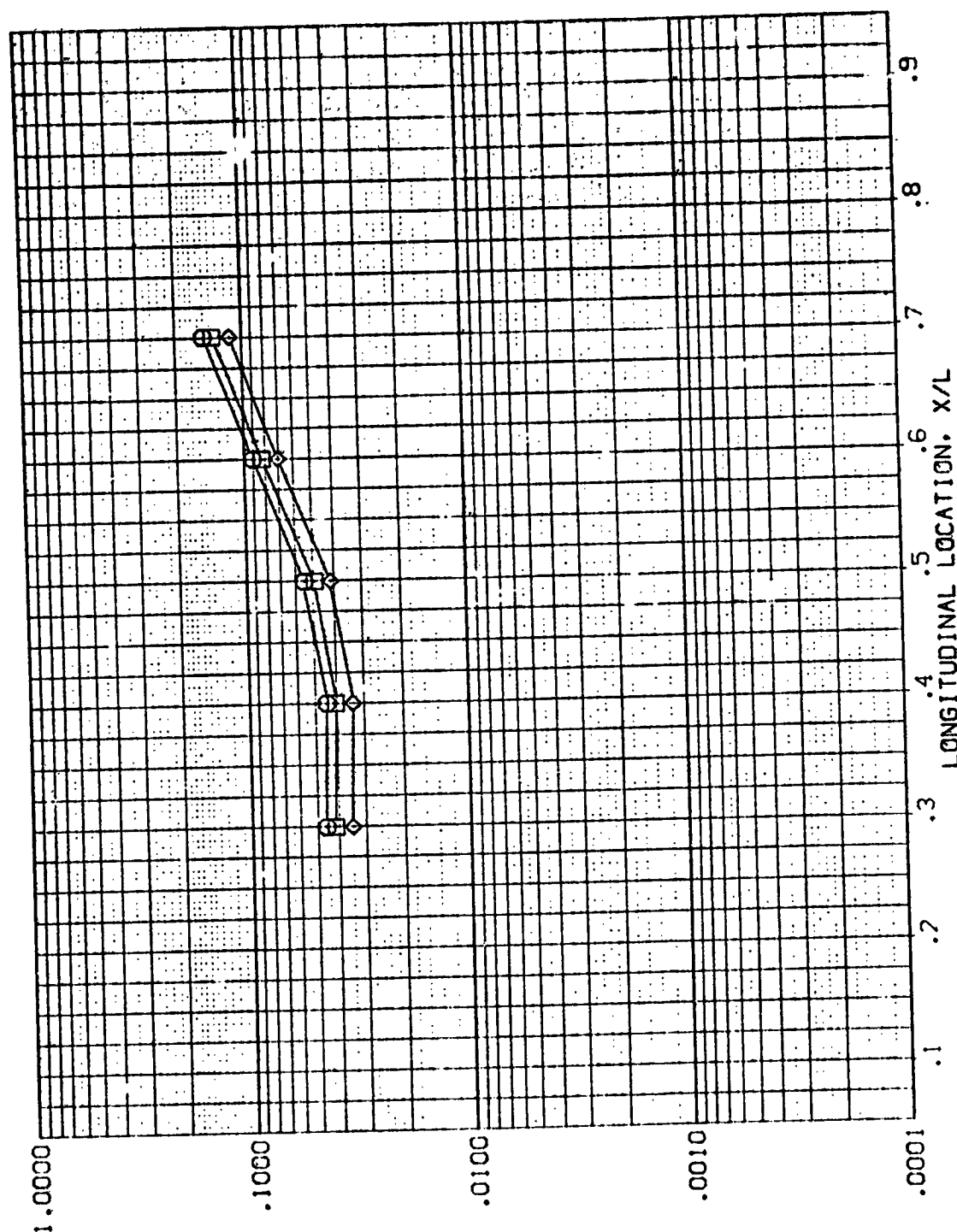


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB08)

SYMBOL HAW/HT Z MACH  
 □ .850 501.000 5.220  
 ○ .900  
 ◇ 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

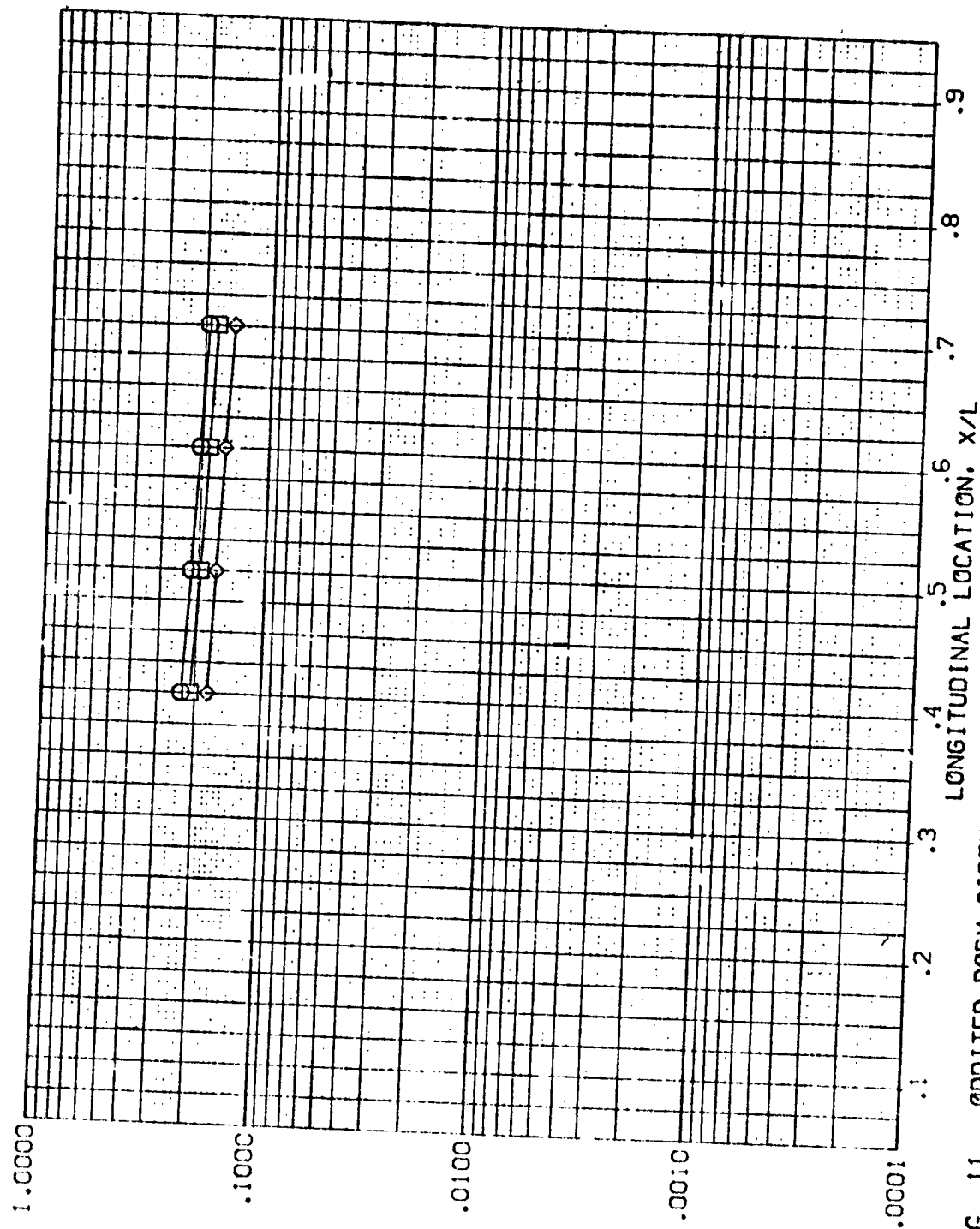


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH-31+T1 BODY SIDEWALL

(REVB09)

SYMBOL	HAW/HF	Z	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◻	.850	375.000	5.220	-30.000	1.000
◻	.900				
◊	1.000				

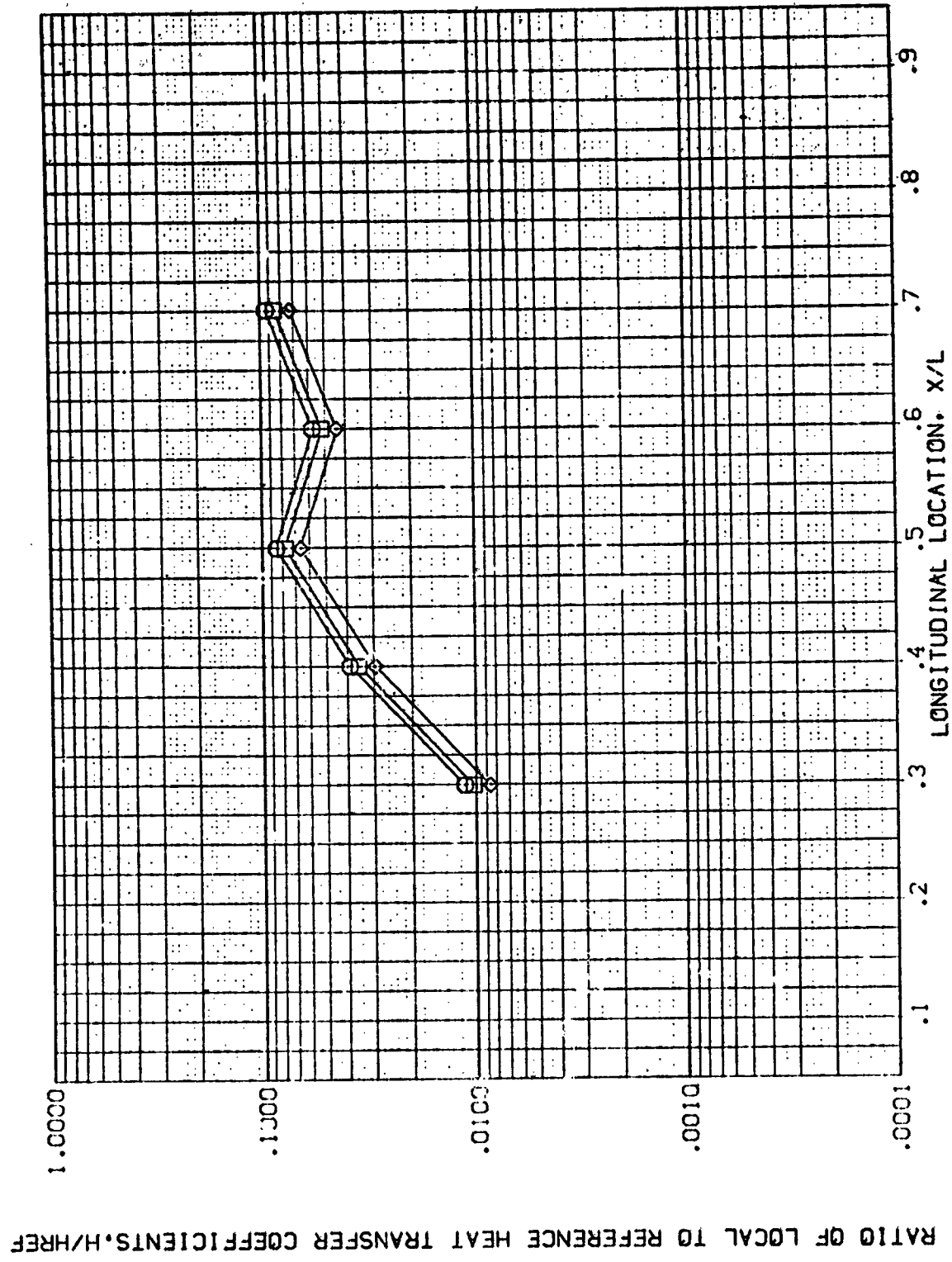


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

PARAMETRIC VALUES  
 ALPHA -30.000 BETA 1.000  
 RV/L .000

SYMBOL HAW/HT Z MACH  
 .850 425.000 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

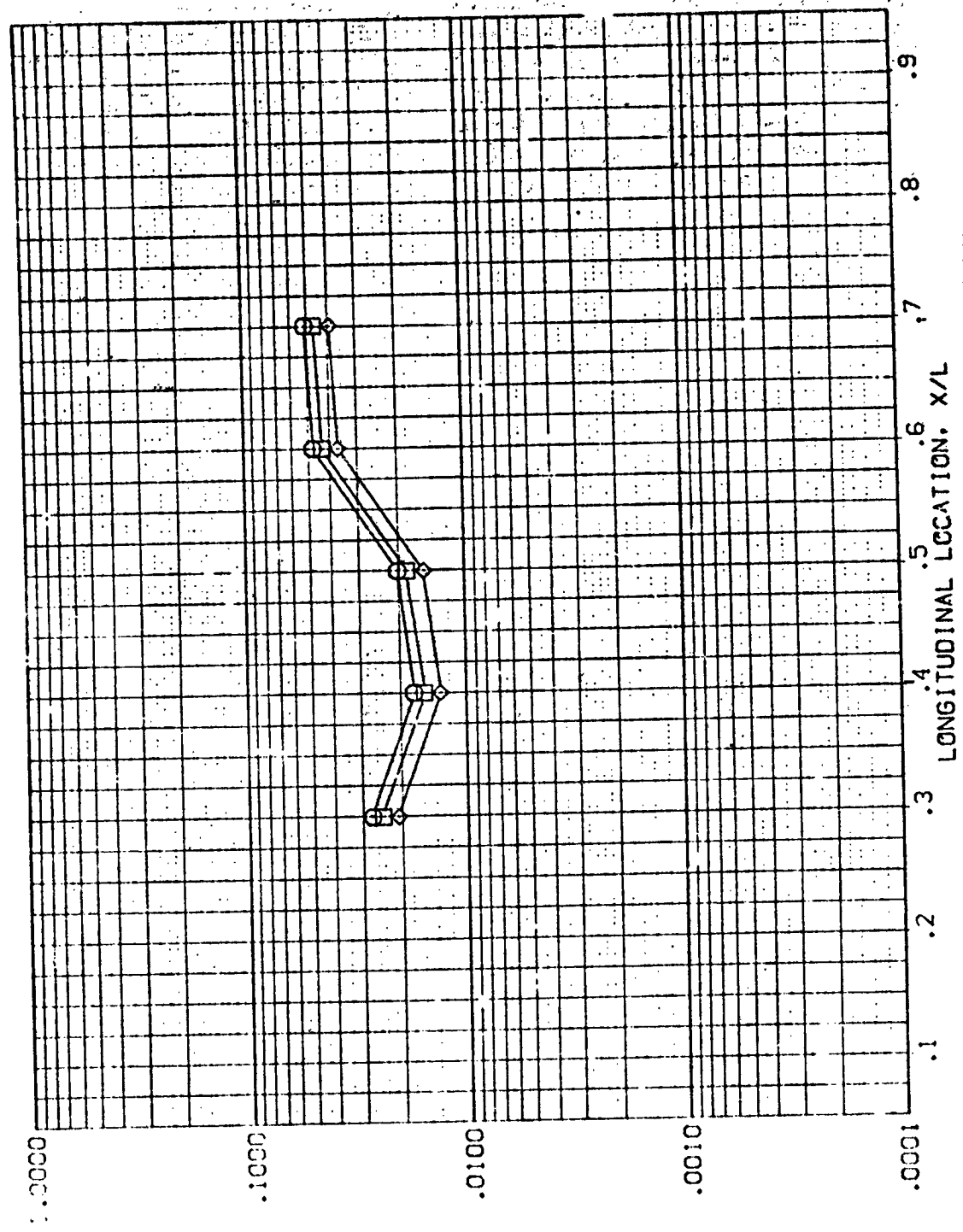


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB09)

PARAMETRIC VALUES  
 -30.000 BETA  
 1.000

ALPHA  
 RN/L

MACH  
 5.220

Z  
 501.000

HP/WHT  
 .850

SYMBOL  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

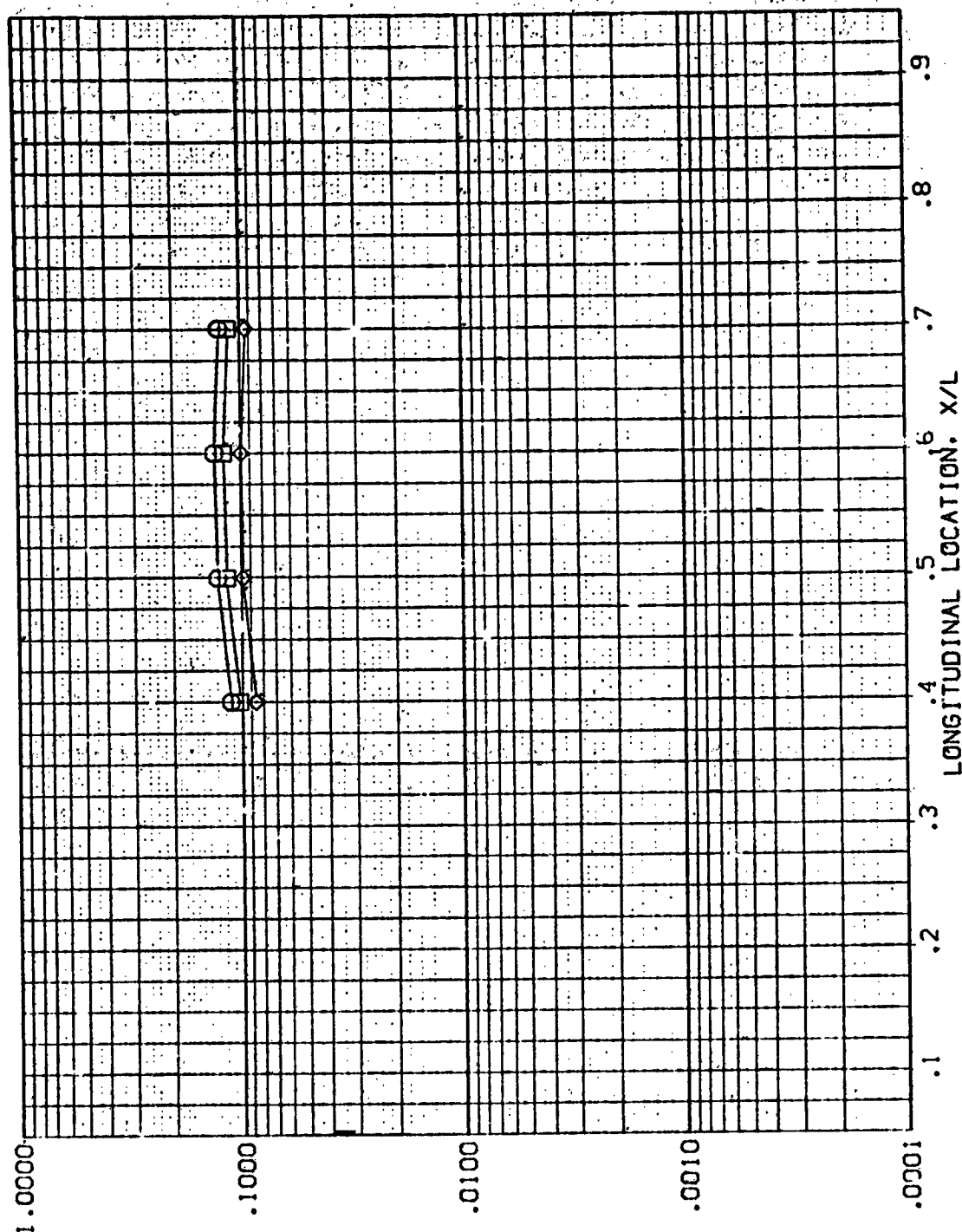


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



AMES 3.5-195 IH28 C1+T1 BODY SIDEWALL

(REVB10)

SYMBOL  
 HAW/HT  
 .850  
 .900  
 1.000

Z  
 375.000  
 MACH  
 5.299

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 60.00  
 4.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

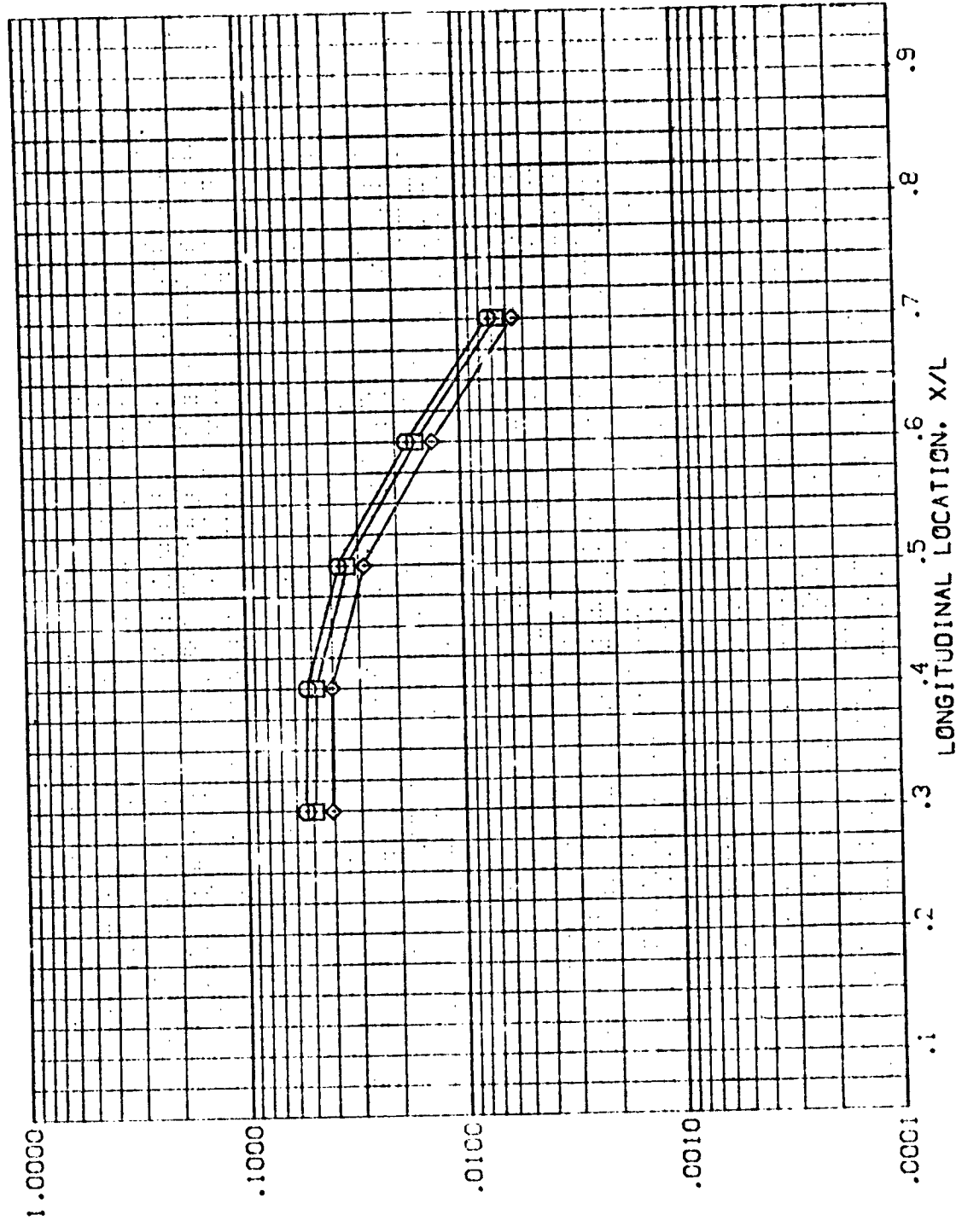


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB10)

SYMBOL:  $\diamond$   $\square$   $\circ$   
 HEIGHT .850  
 Z 425.000  
 MACH 5.299  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 RN/L 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

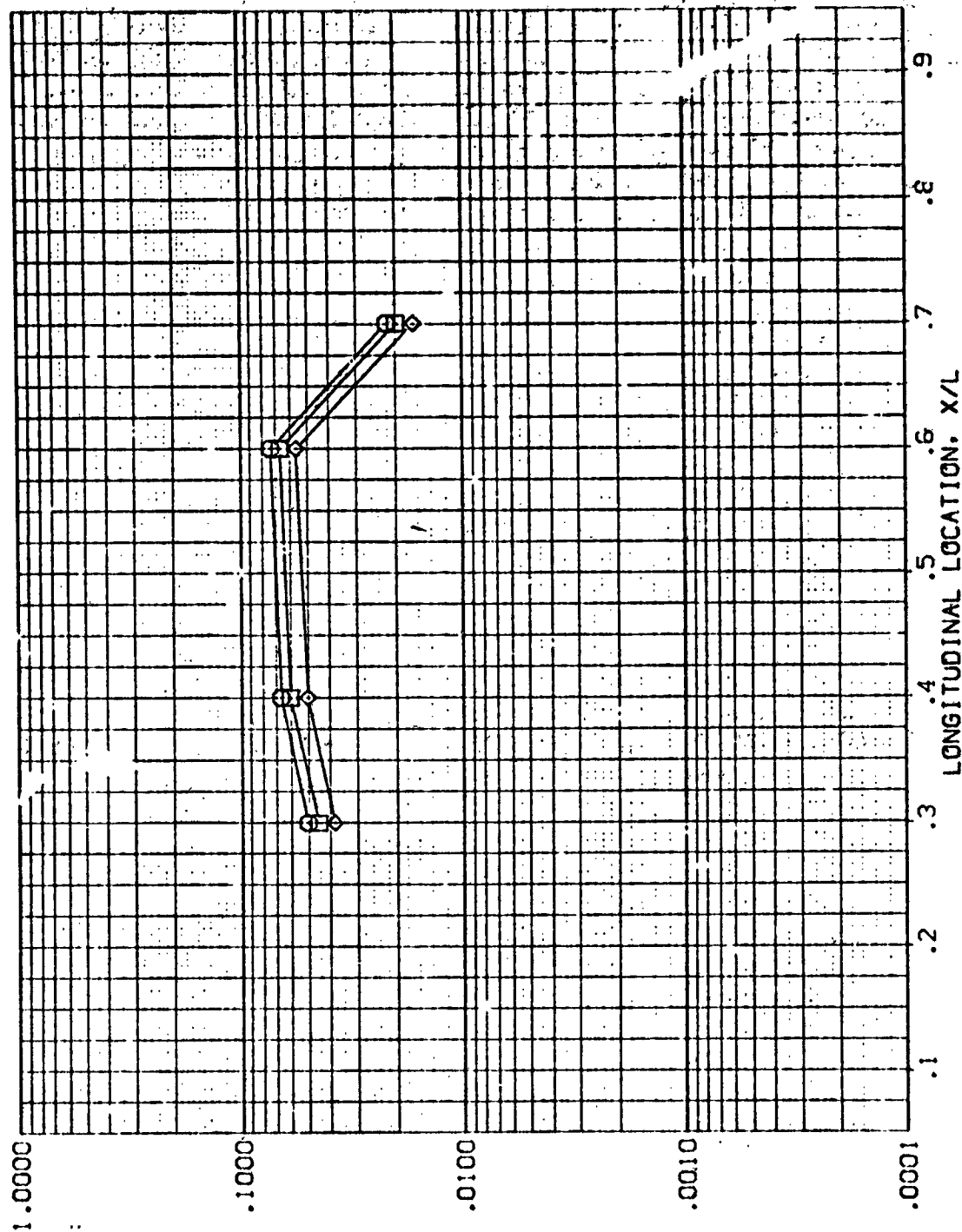


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REVB10)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL  $\diamond$   $\square$   
 H/W/HT .850  
 Z 501.000  
 MACH 5.299  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 4.000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

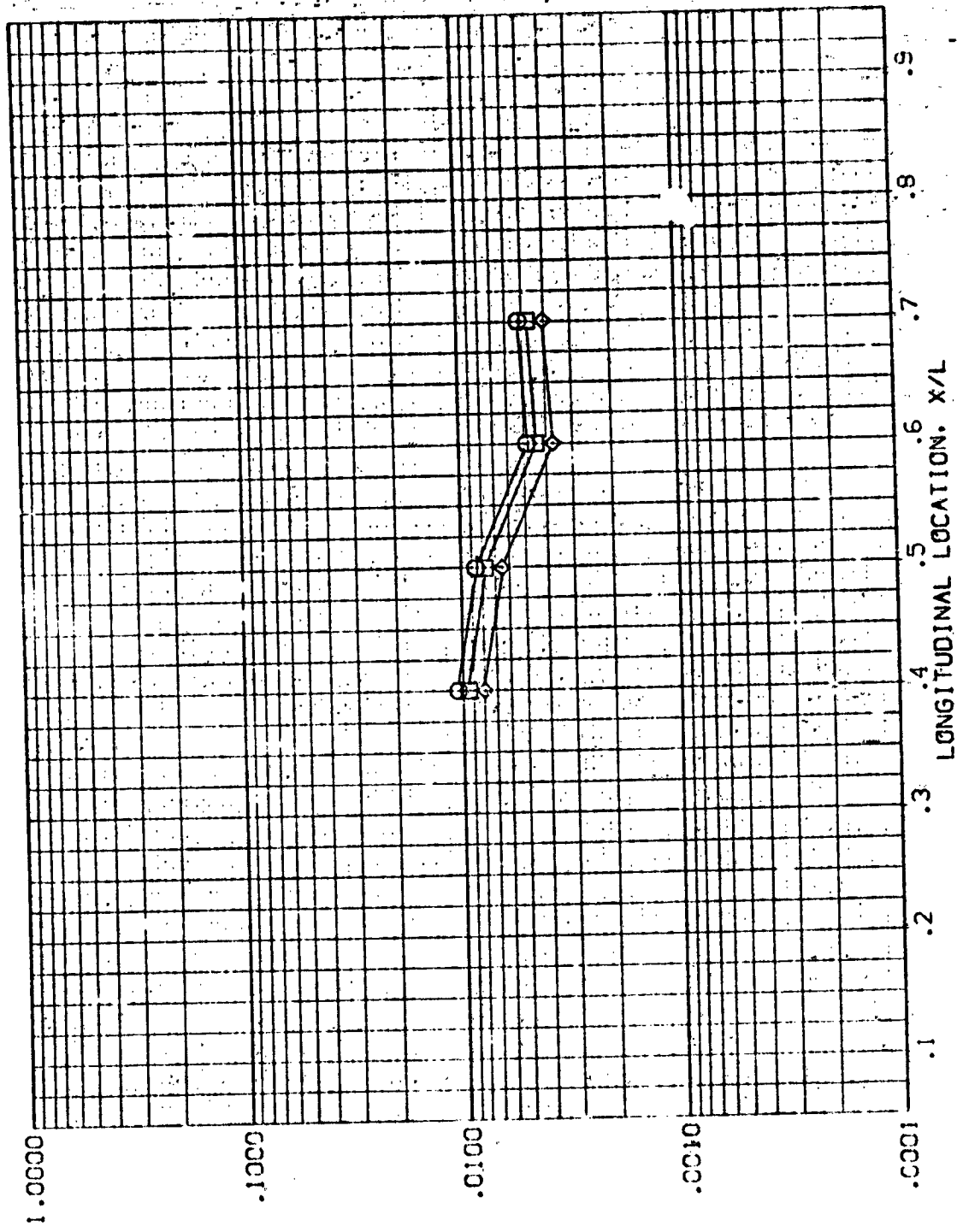


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB )

SYMBOL  
 □  
 ◇

HAW/HT  
 .850  
 .900  
 1.000

Z  
 375.000

MACH  
 5.300

PARAMETRIC VALUES  
 ALPHA  
 RV/5

30.000

BETA  
 4.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

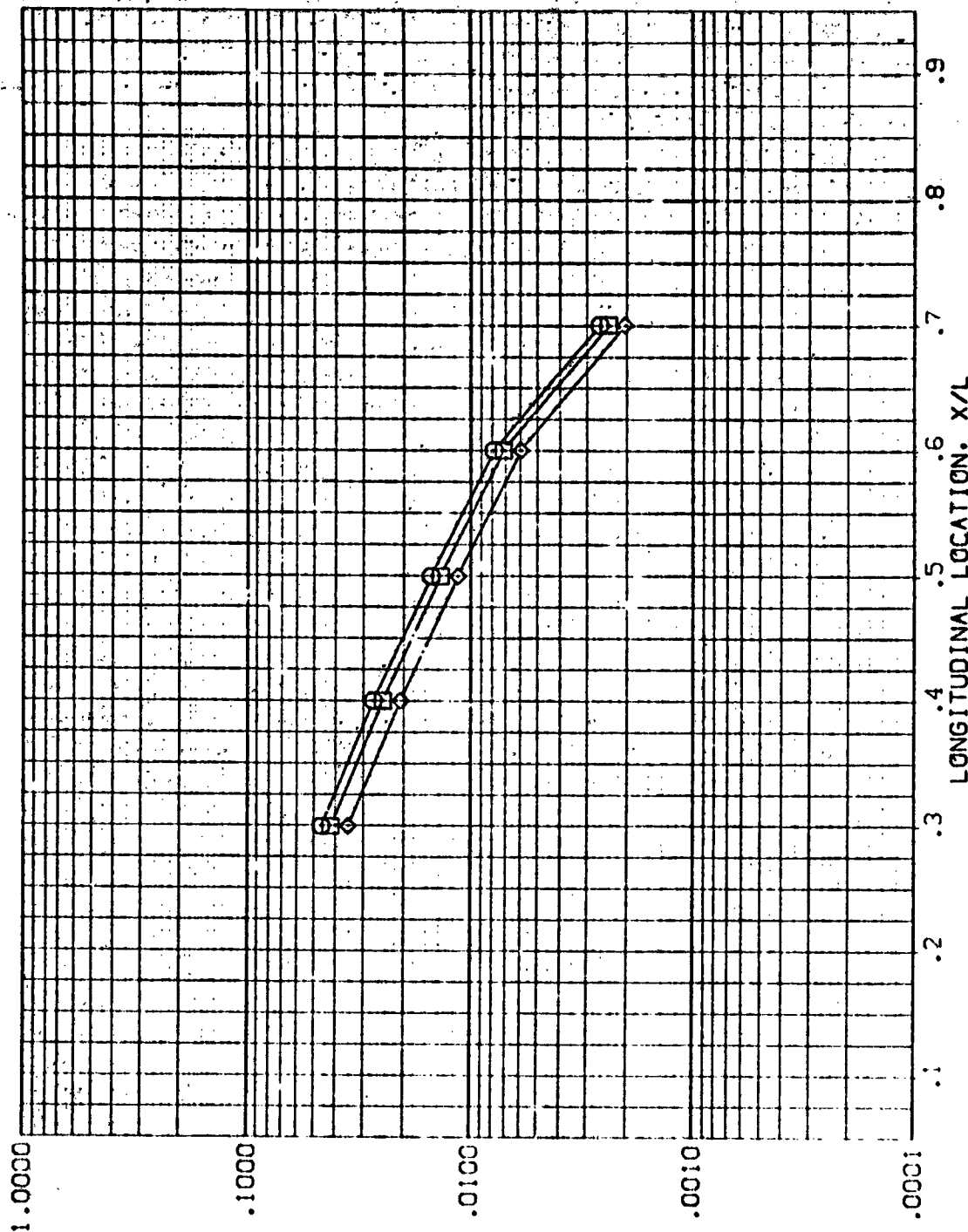


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(PRE-5117)

SYNOPSIS  
 H/W/MT .850  
 Z 425.000  
 MACH 5.303  
 .900  
 1.000

PARAMETRIC VALUES  
 A-204  
 B-214  
 30.000  
 4.000  
 0.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

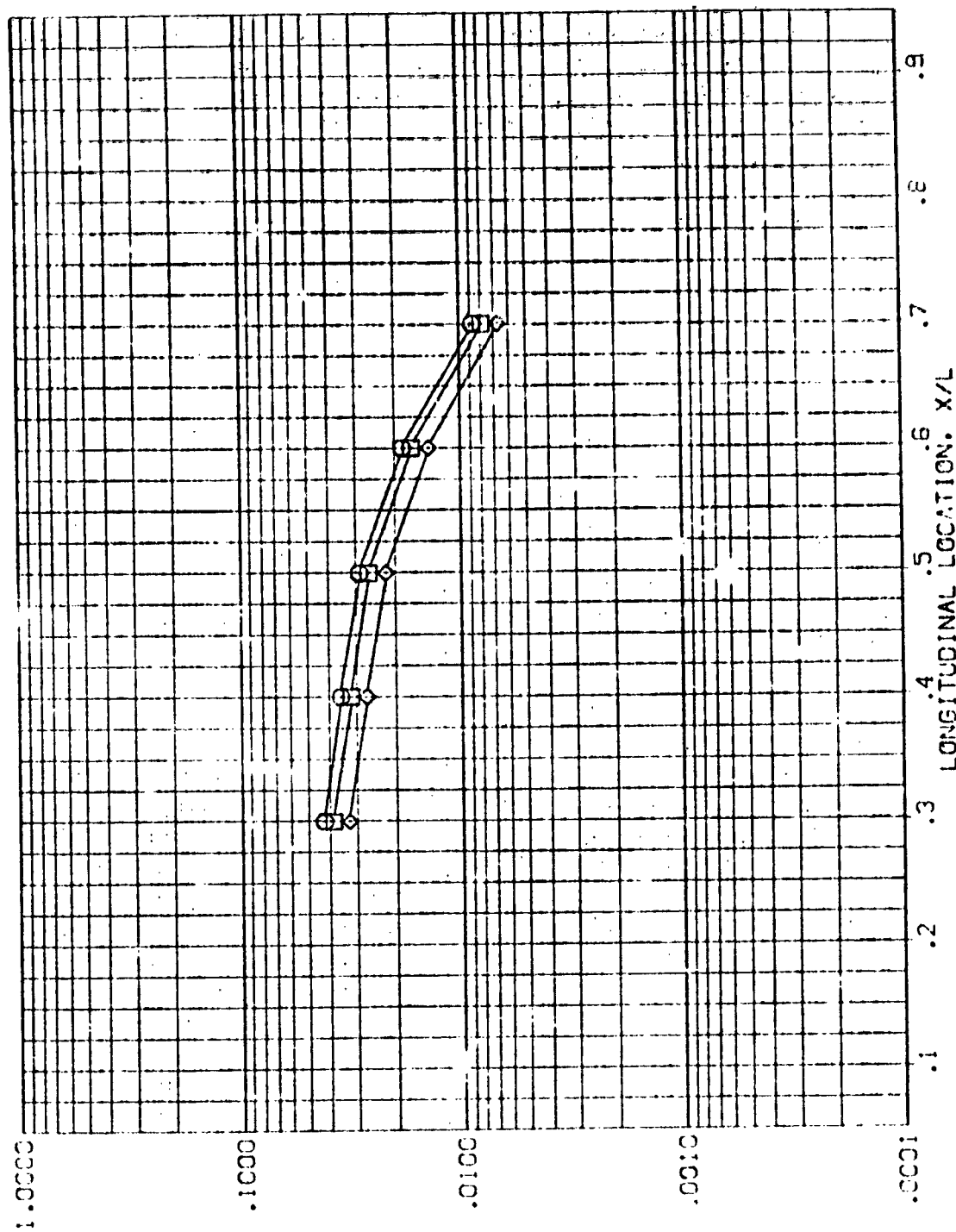


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REV811)

SYMBOL	HAU/HT	Z	MACH	PARAMETRIC VALUES
□	.850	501.000	5.300	ALPHA 30.000 BETA .000
◇	.900			RV/L 4.000
	1.000			

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

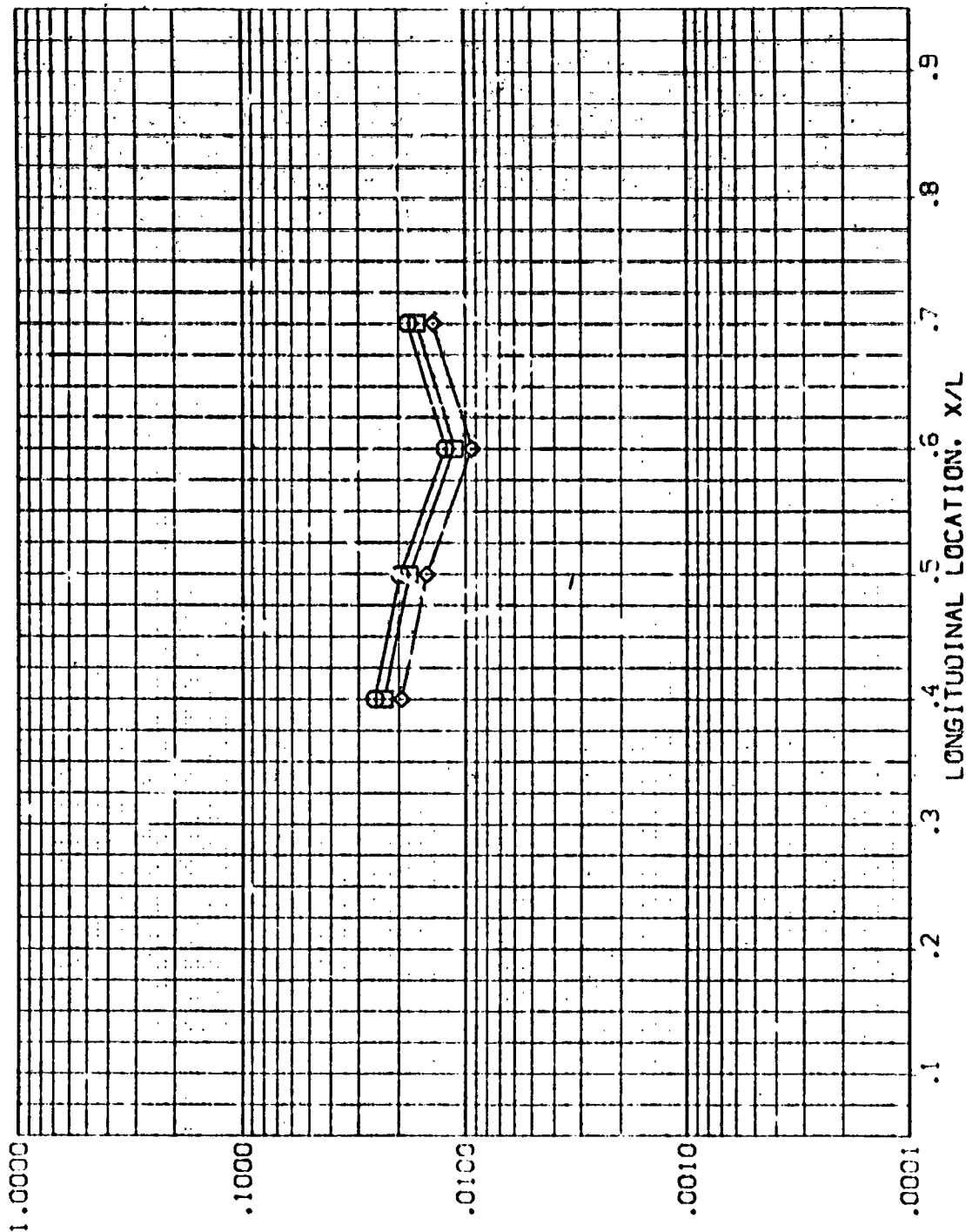


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV.312)

SPRINT

MAW/HT  
.850  
.900  
1.000

Z  
375.000  
MACH  
5.220

PARAMETRIC VALUES  
ALPHA  
5.1  
30.000  
35.1  
1.000  
-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

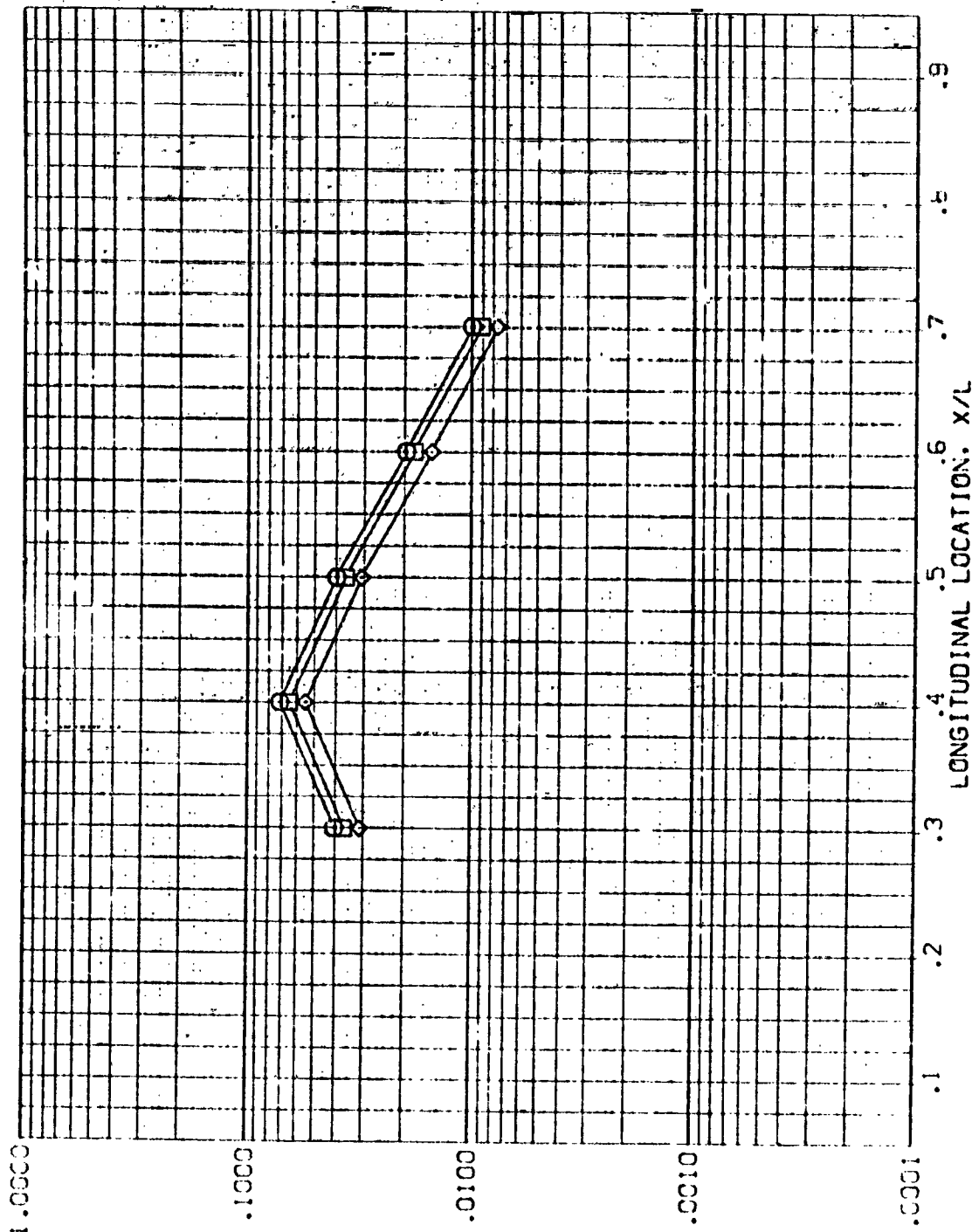


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB12)

SYMBOL

HAU/HT

Z

MACH

425.000

5.220

.850

.900

1.000

ALPHA  
RN/L

PARAMETRIC VALUES  
30.000 BETA  
1.000

-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

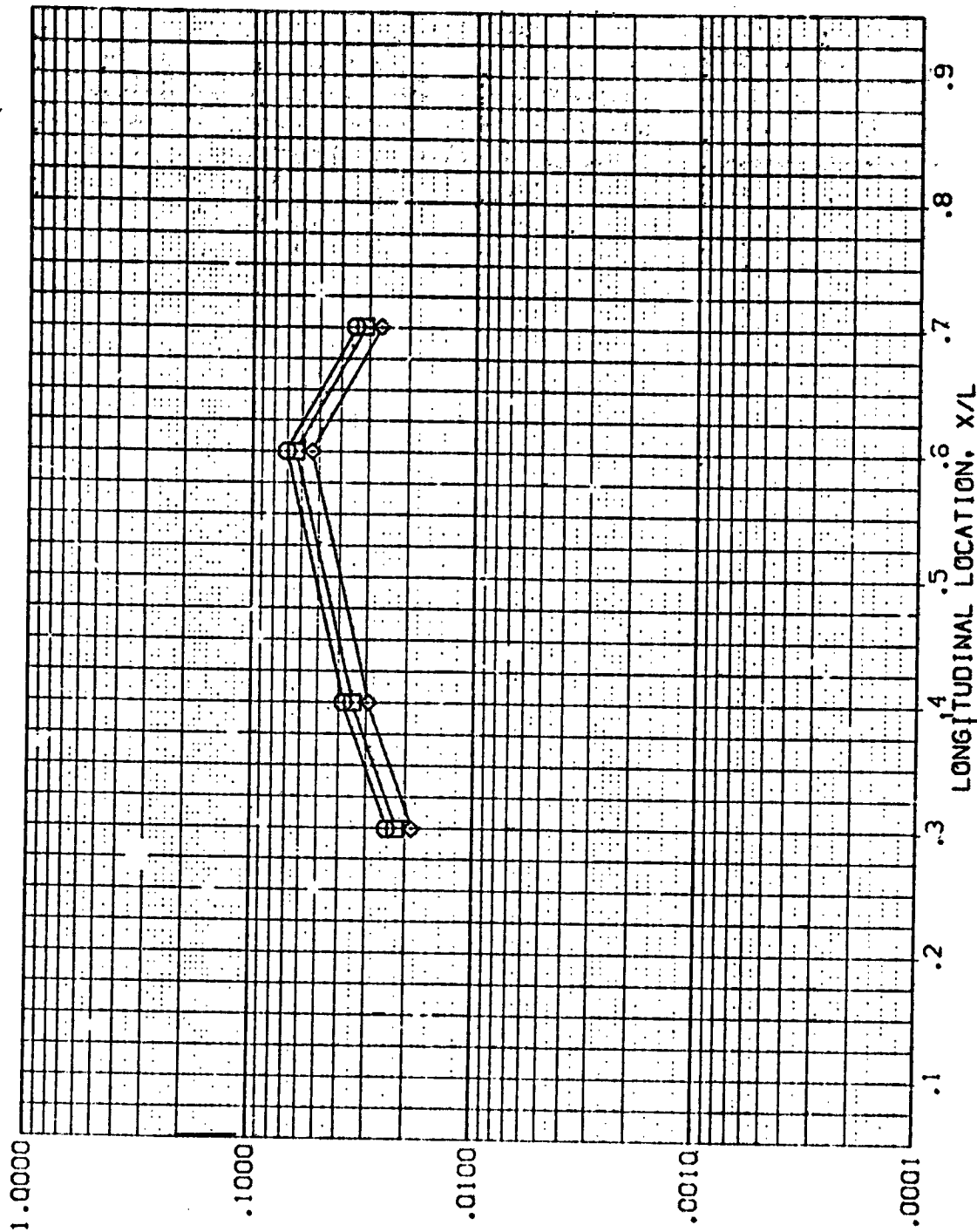


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



(REVB12)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL  
□  
◇

HAW/H  
.850  
.900  
1.000

Z  
501.000

MACH  
5.220

ALPHA  
RN/L

30 000  
1.000

PSI METRIC VALUES  
BETA  
-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

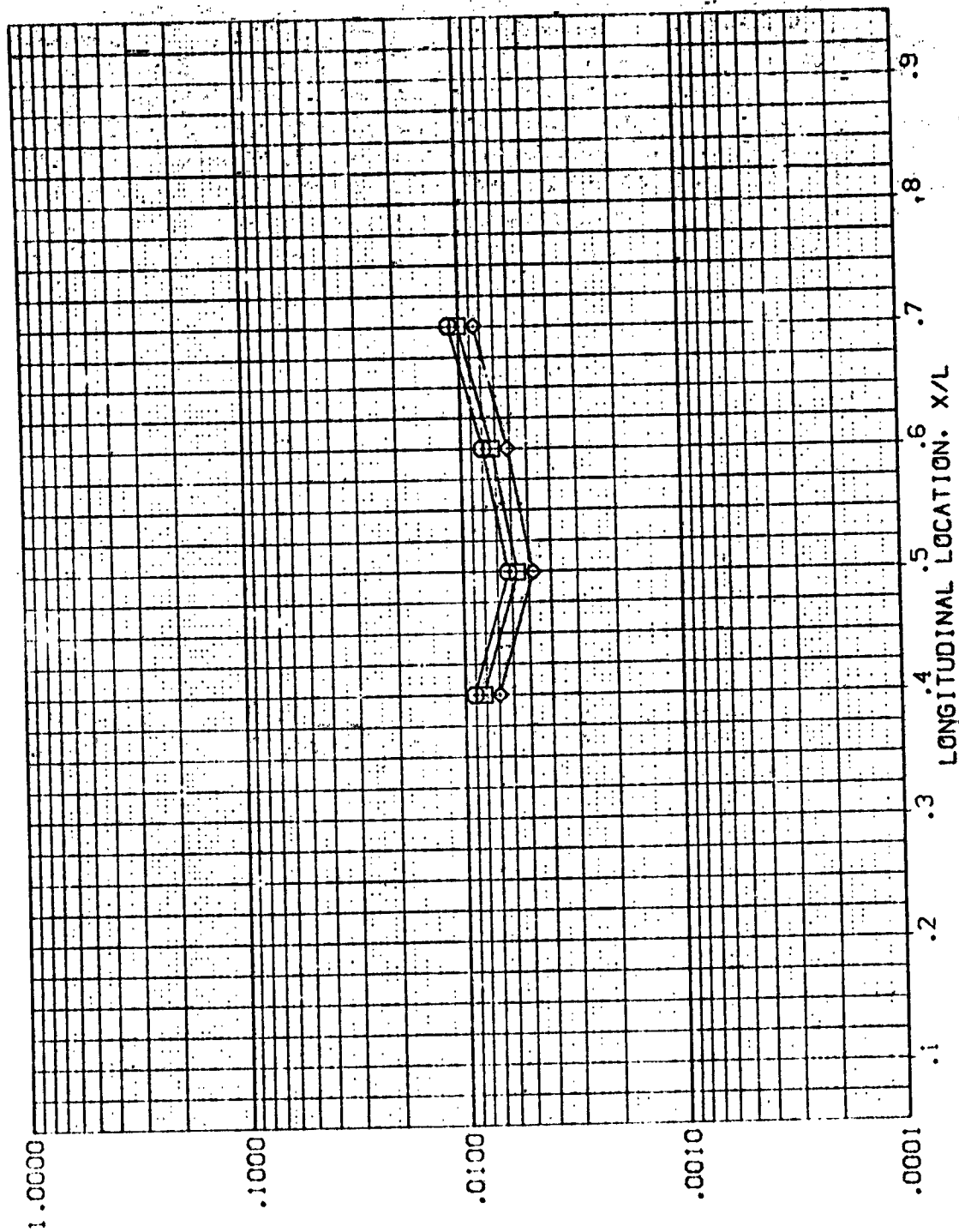


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB01)

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .300 5.228  
 □ .900  
 ◊ 1.000

PARAMETRIC VALUES  
 ALPHA .000 BETA .000  
 KW/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

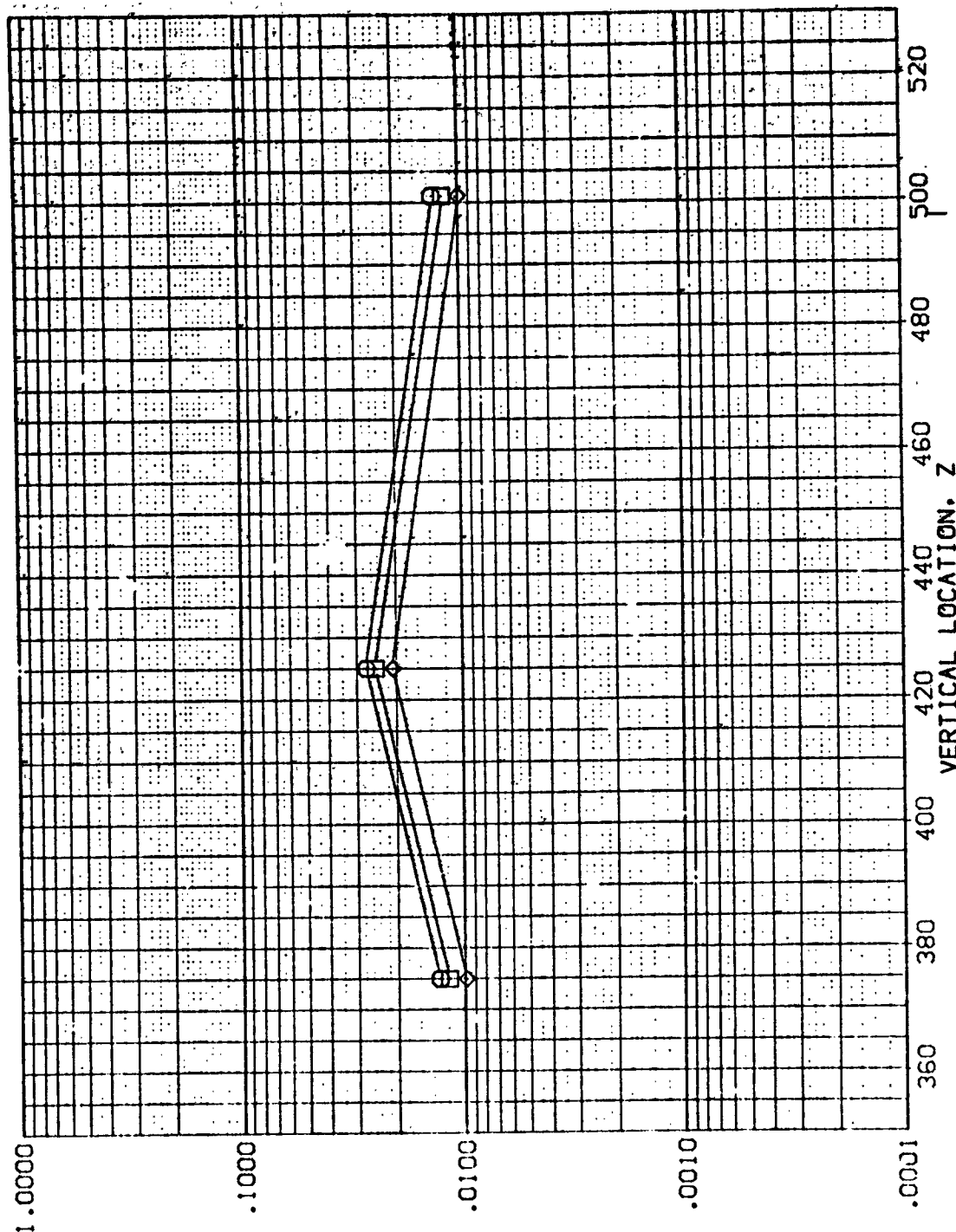


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .400 5.228  
 □ .300  
 ◊ 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

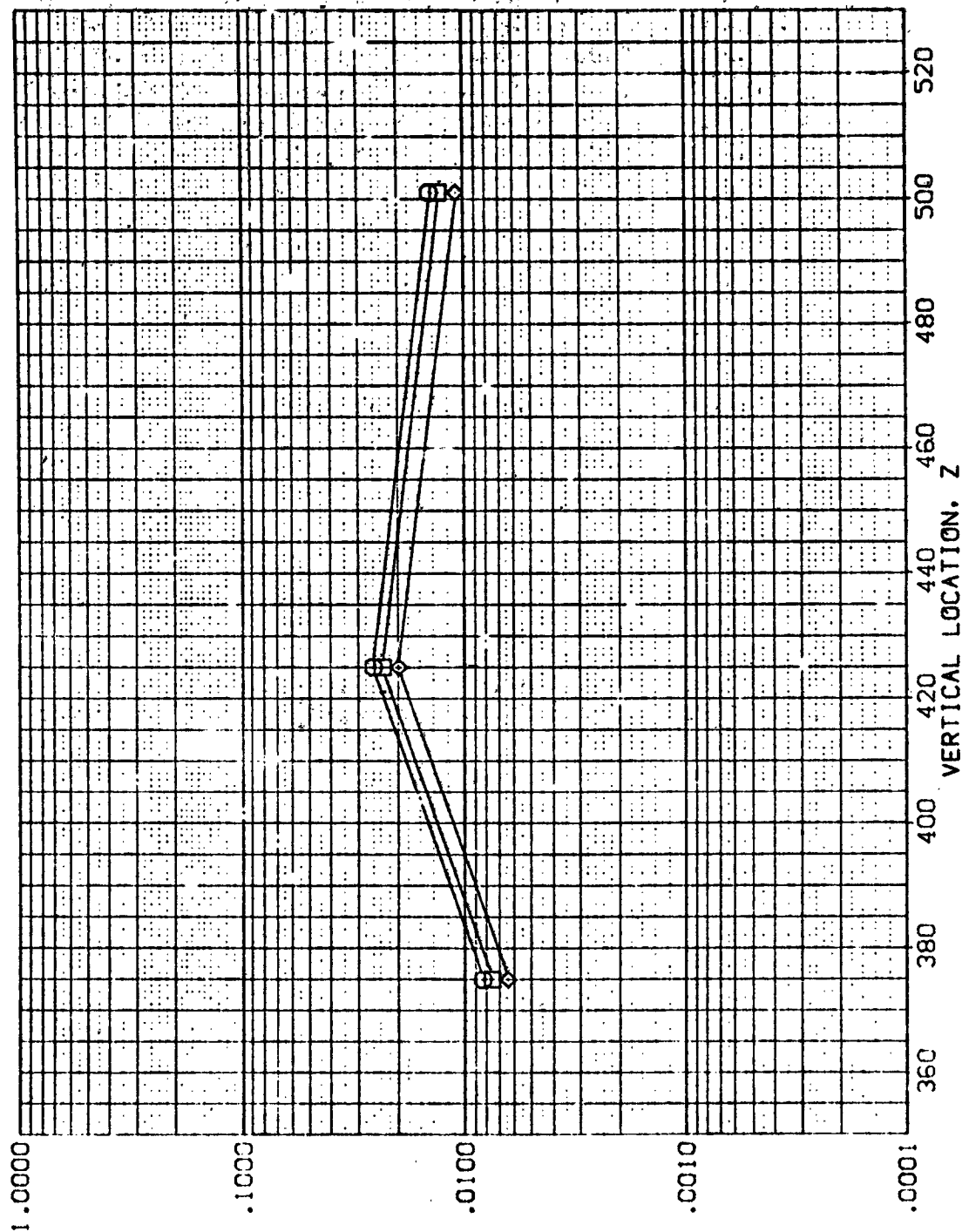


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB01)

SYMSC. HAW/HT X/L MACH  
 .850 .500 5.228  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

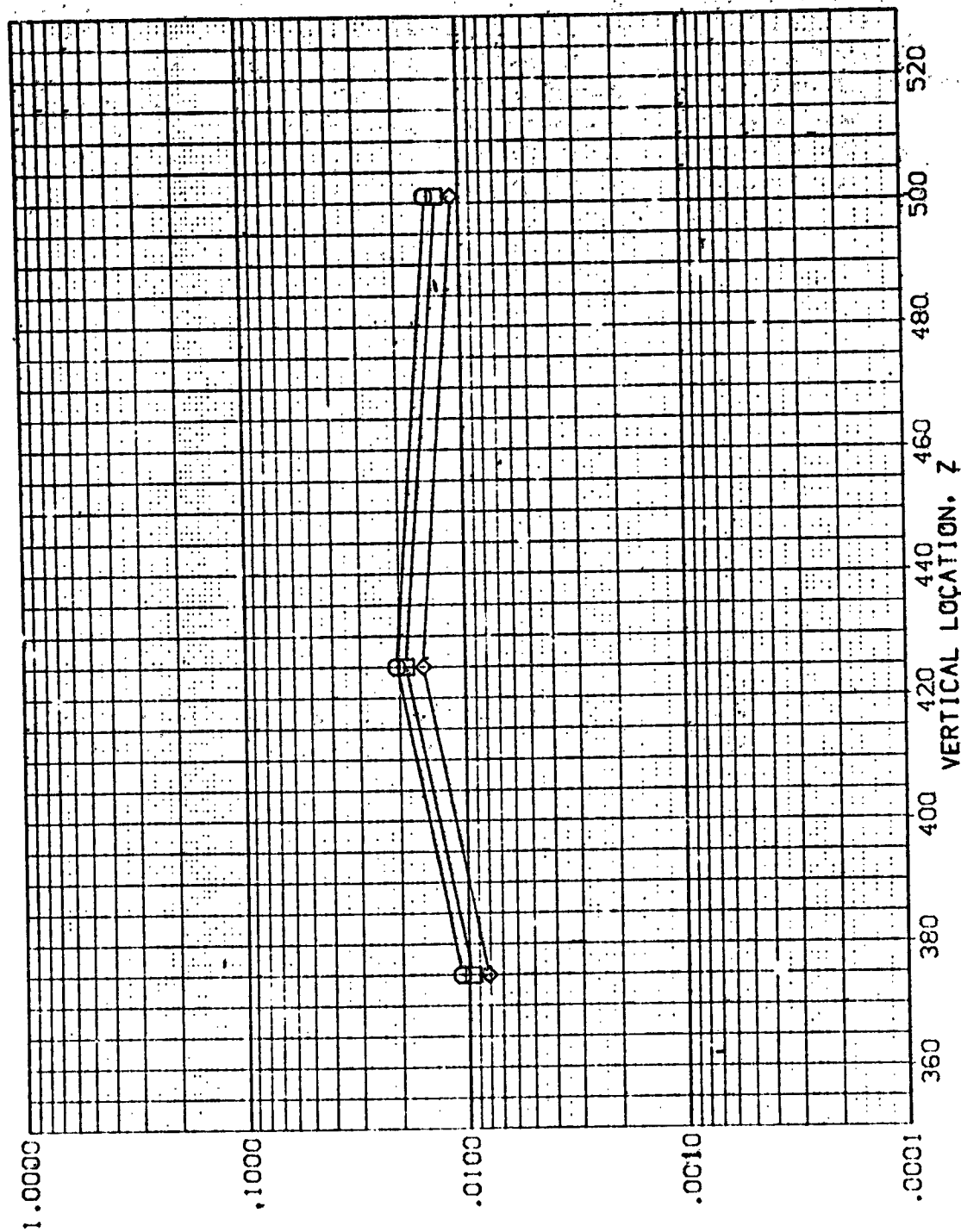


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVBO1)

SYMBOL  
 □  
 ○  
 ◇

HAW/HT X/L MACH  
 .850 .600 5.228  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

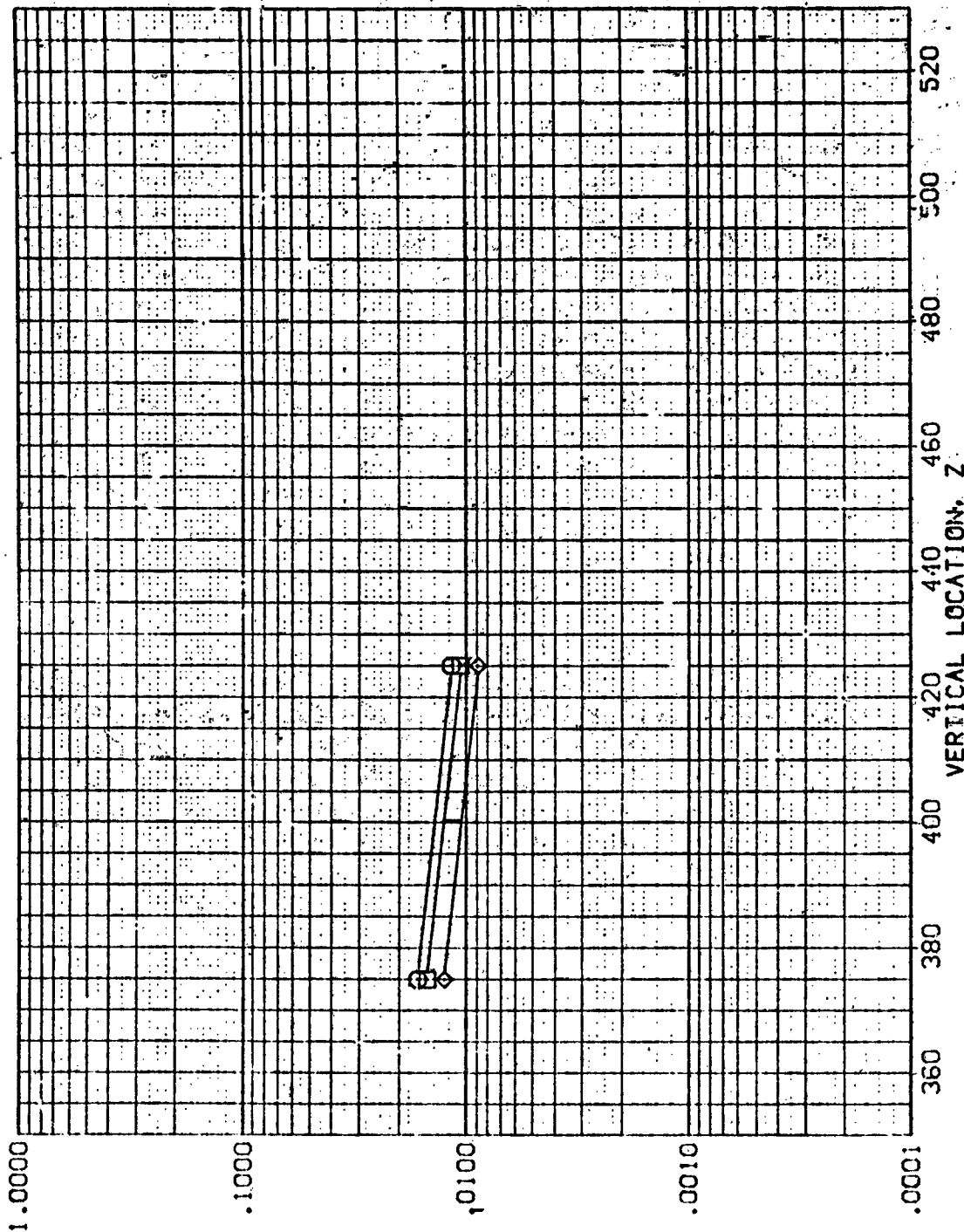


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL-

(REVB01)

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 RN/L 1.000

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .700 5.228  
 □ .900  
 ○ 1.000

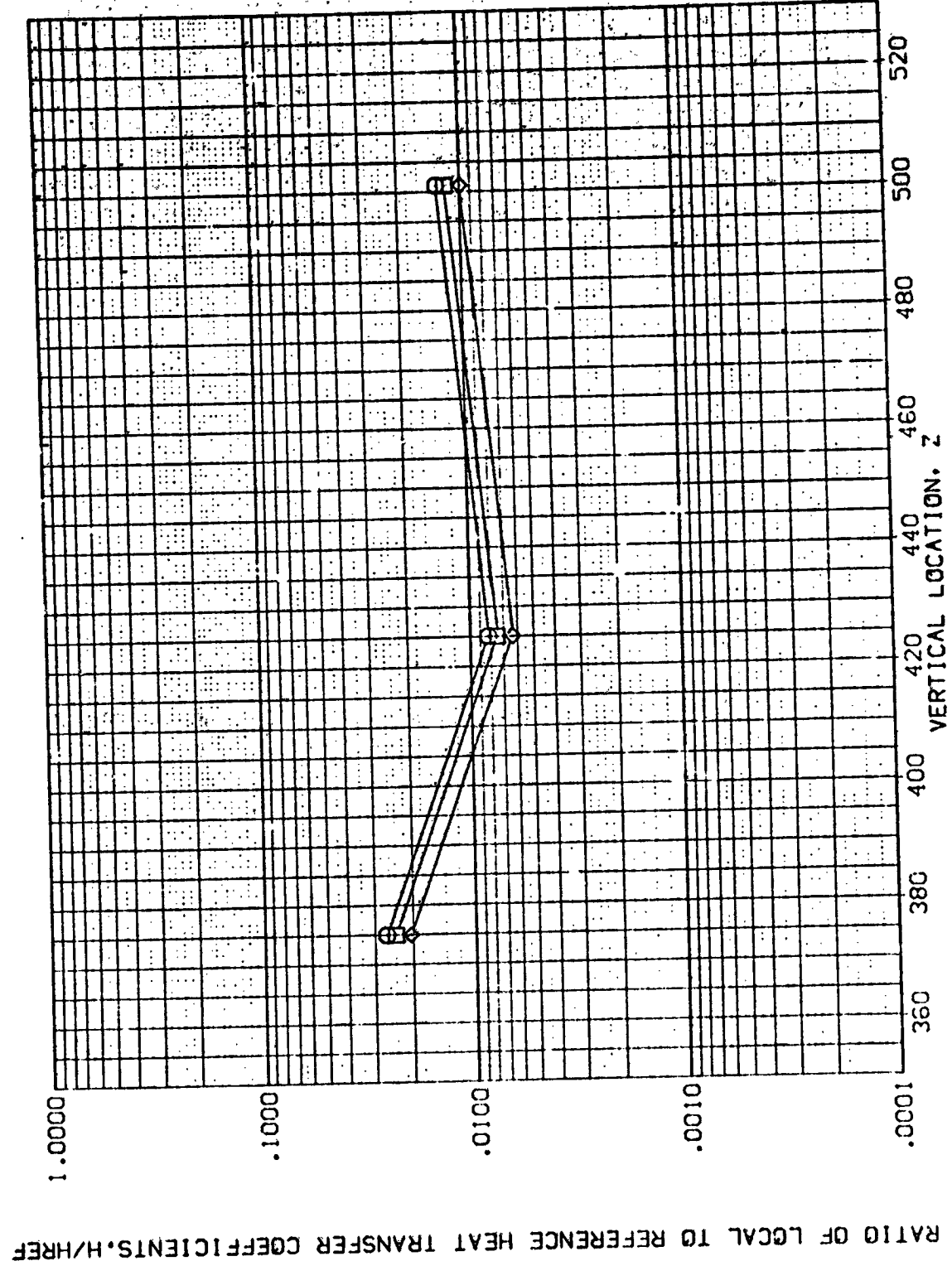


FIG. 11 ORBITER BODY SIDEWALL. ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV B02)

SYMBOL  
 ◇  
 ○  
 □

HA/W/HT  
 .950  
 .900  
 1.000

K/L  
 .300

MACH  
 5.219

PARAMETRIC VALUES  
 30,000 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

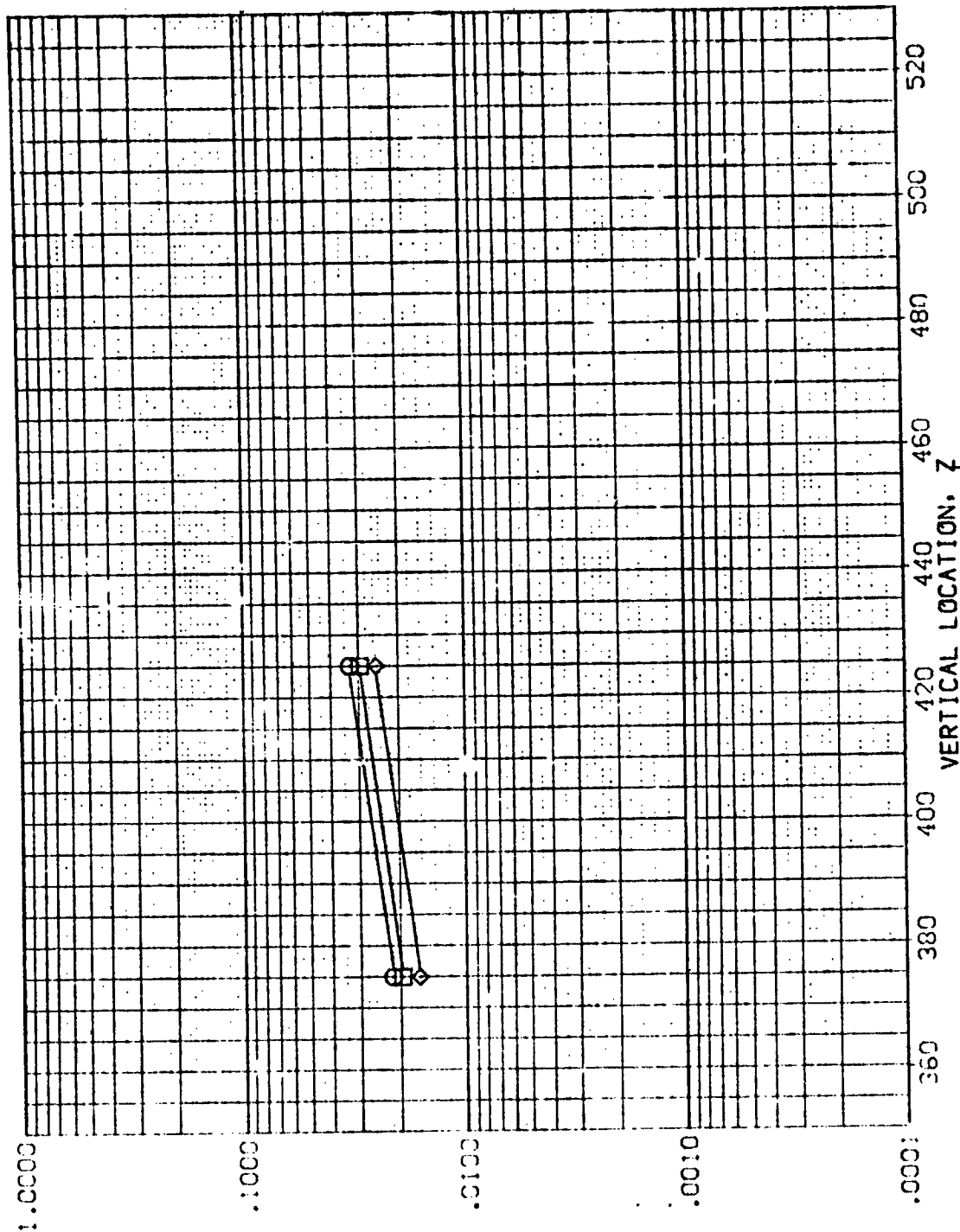


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REV B02)

PARAMETRIC VALUES

ALPHA 30.000 BETA .000

RN/L 1.000

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYNOPSIS

MAW/HT .850 X/L .100 MACH 5.219

.900

1.000

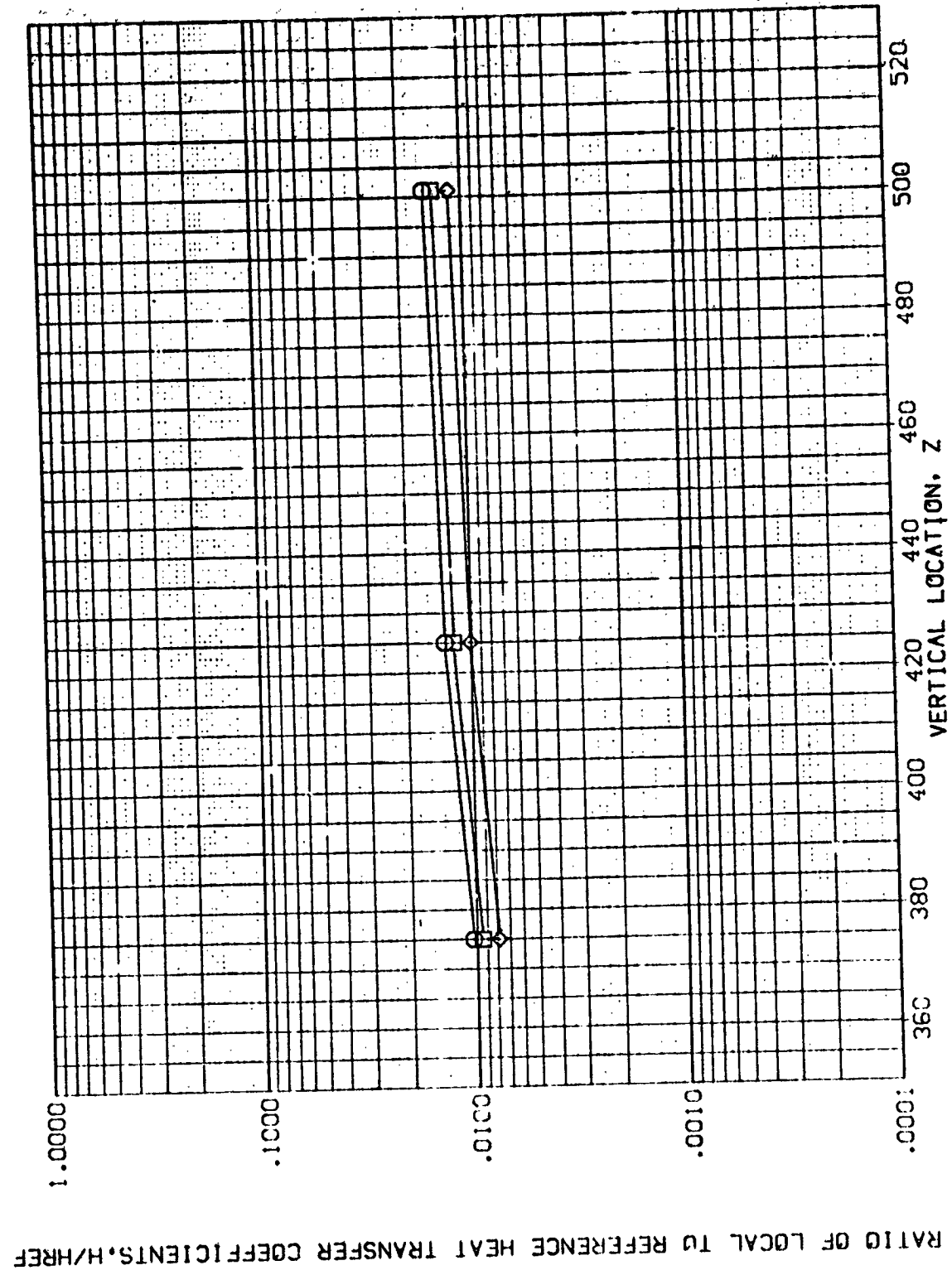


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



(REV 6-2)

SVBC	HAW/H	X/L	MACH
◇	1.000	.500	5.219
□	.006		
○	.050		

PARAMETRIC VALUES	
ALPHA	BETA
30.000	1.000
RN/L	

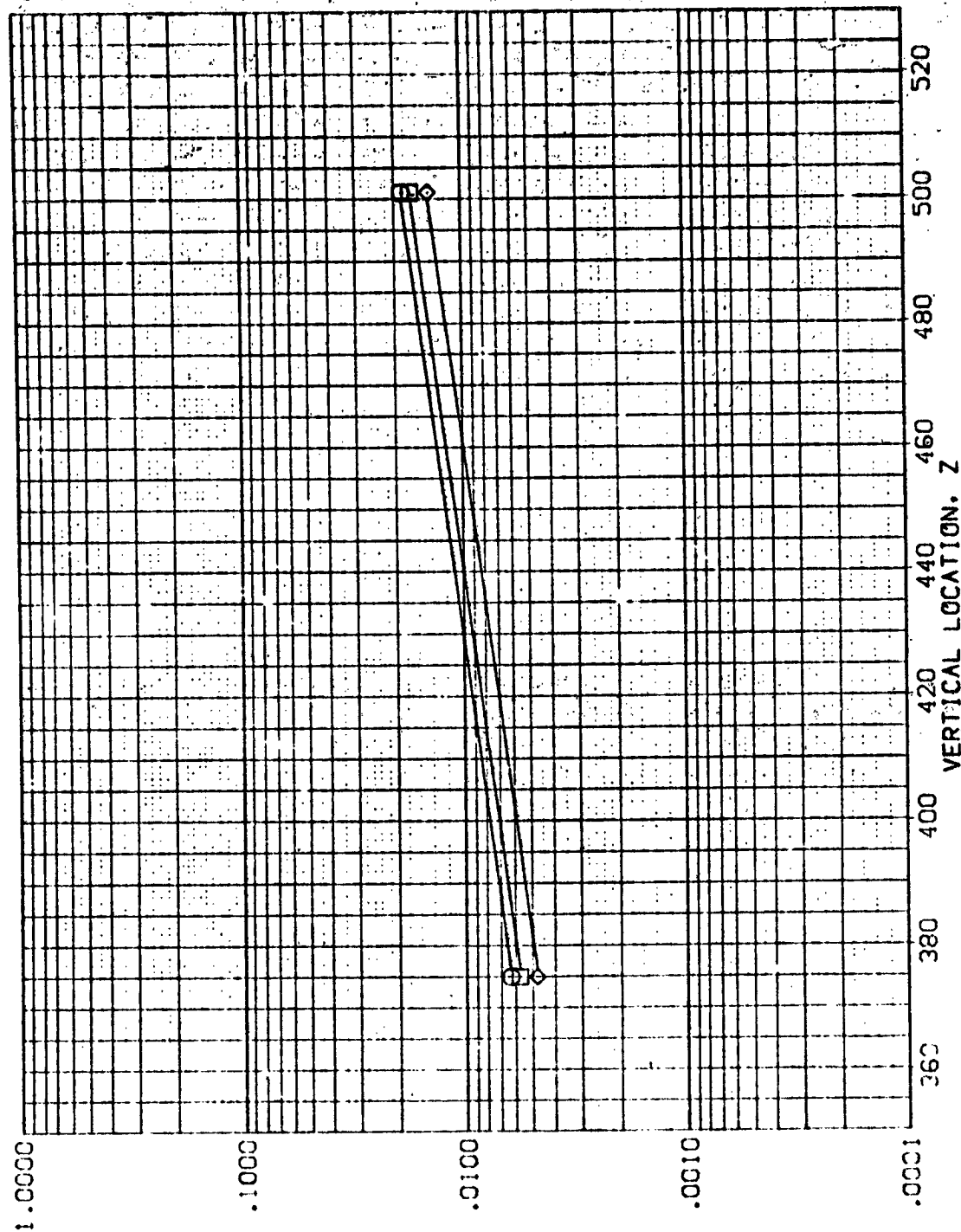
RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$ 

FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK.

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV802)

SYMBOL	MAV/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	.850	.600	5.219	30.800	.000
□	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

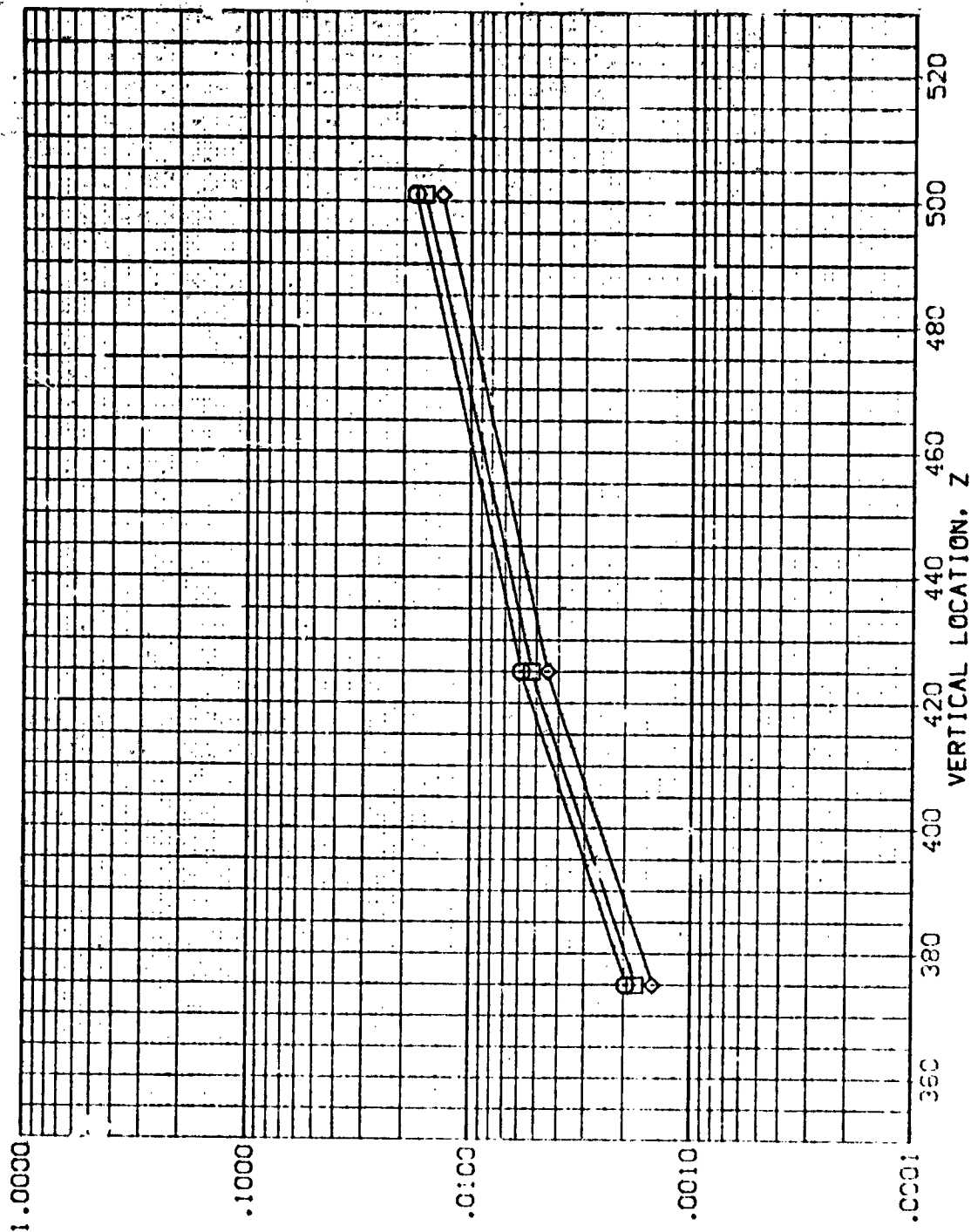


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1428 01+T1 BODY SIDEWALL

RE.8020

SV932-  
 WAVE/HT .850  
 X/L .700  
 MACH 5.219  
 1.000

PARAMETER VALUES  
 ALPHA 30.000  
 BE/A 1.000  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

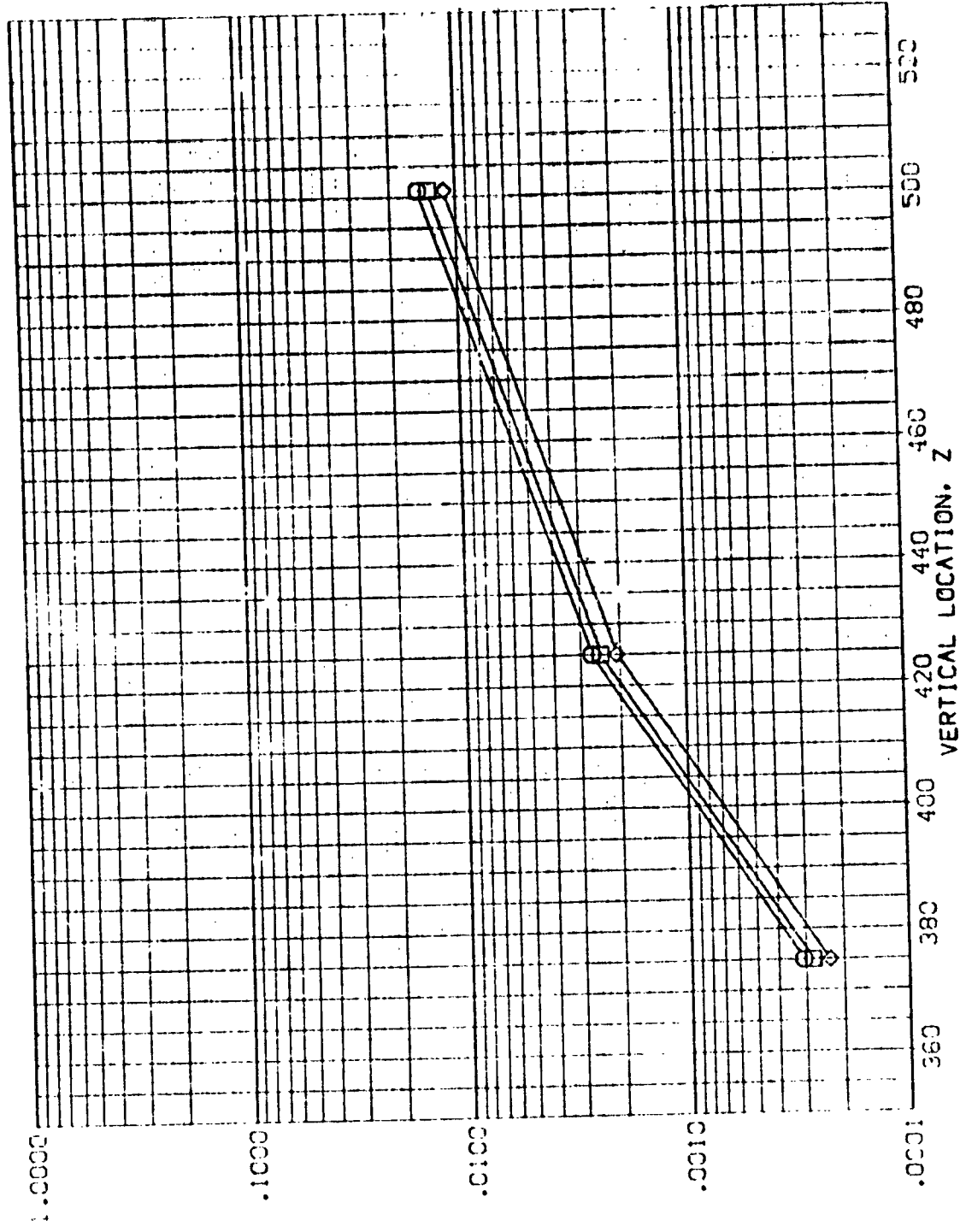


FIG. 11 ORBITER BODY SIDEWALL. ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1428 01+T1 BODY SIDEWALL

(REVB03)

PARAMETRIC VALUES  
 60.000 BETA  
 1.0000

SYMBOL HAW/HT X/L MACH  
 ◇ .85C .300 5.220  
 □ .900  
 ◊ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

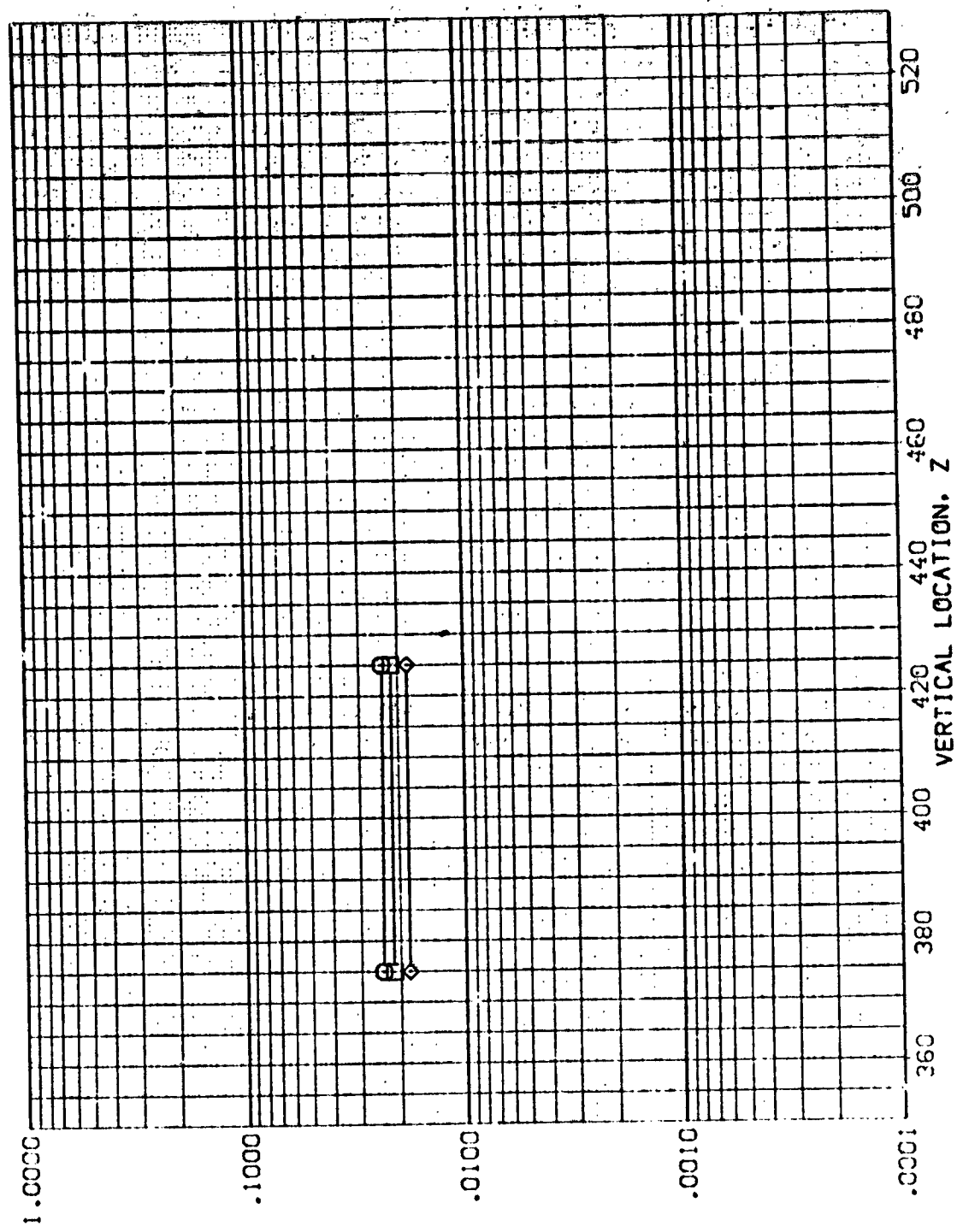


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVISED)

PARAMETRIC VALUES  
ALPHA .000  
BETA .000  
EDIC .000  
RNAL .000

SYMBOL MACH/K X/L MACH  
1.000 .850 .400 5.220  
1.000 .850 .400 5.220  
1.000 .850 .400 5.220

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

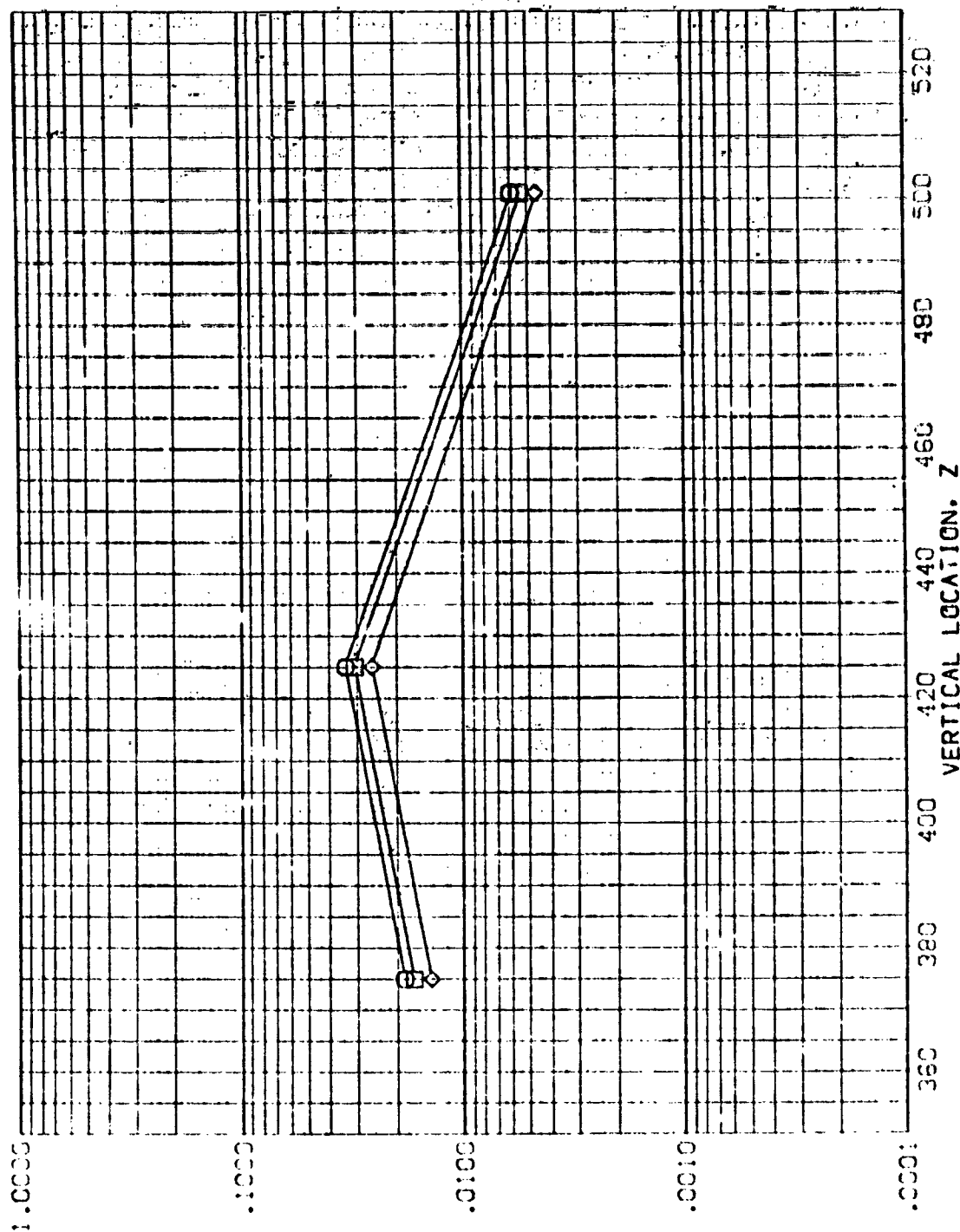


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB03)

SYMBOL	HAZ/HT	X/L	MACH	PARAMETRIC VALUES
◇	.850	.500	5.220	ALPHA 60.000 BETA .000
□	.900			RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

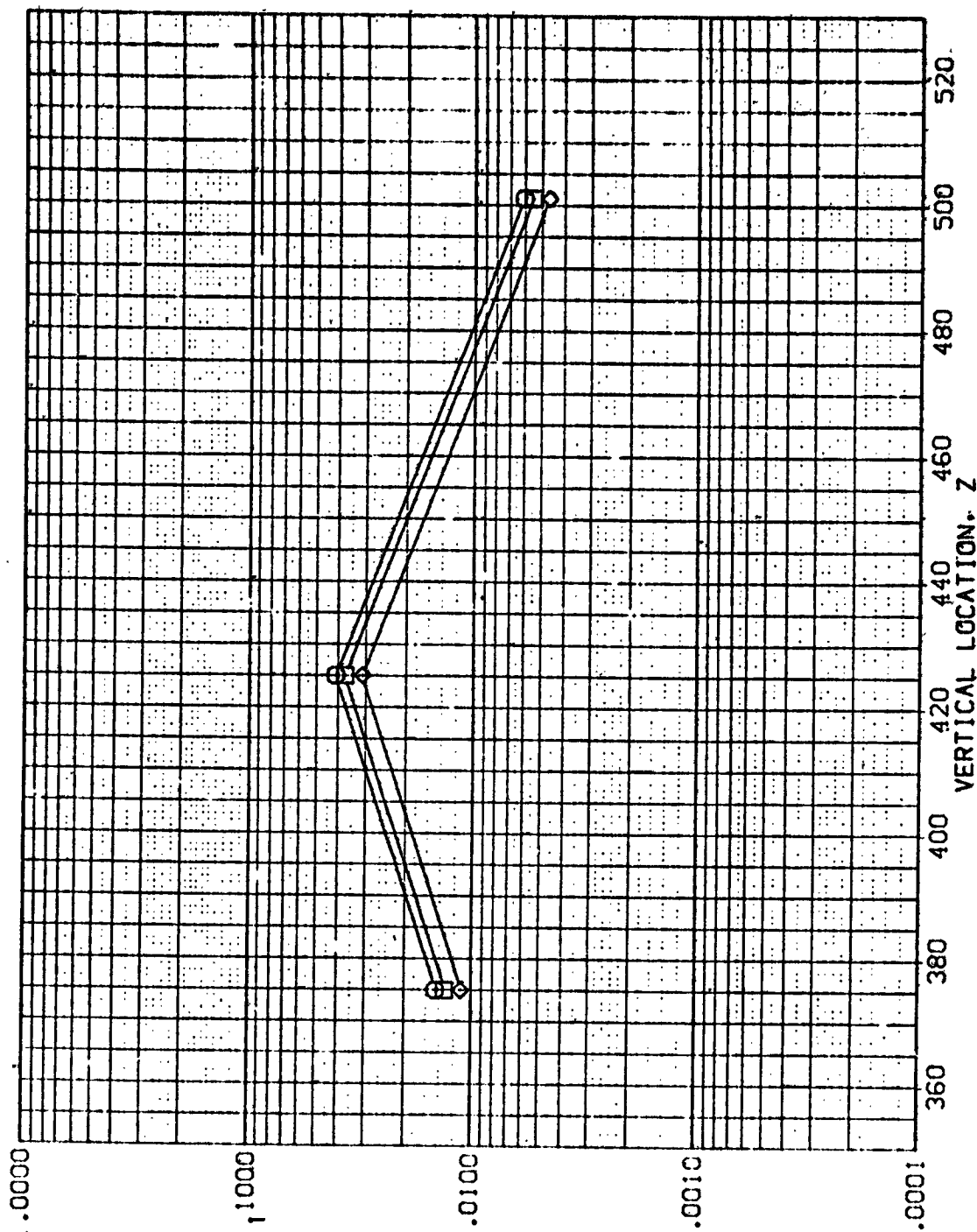


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

SYMBOL HAW/HT X/L MACH  
 ◇ .950 .600 5.220  
 ○ .900  
 △ 1.000

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 1.000  
 RNL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

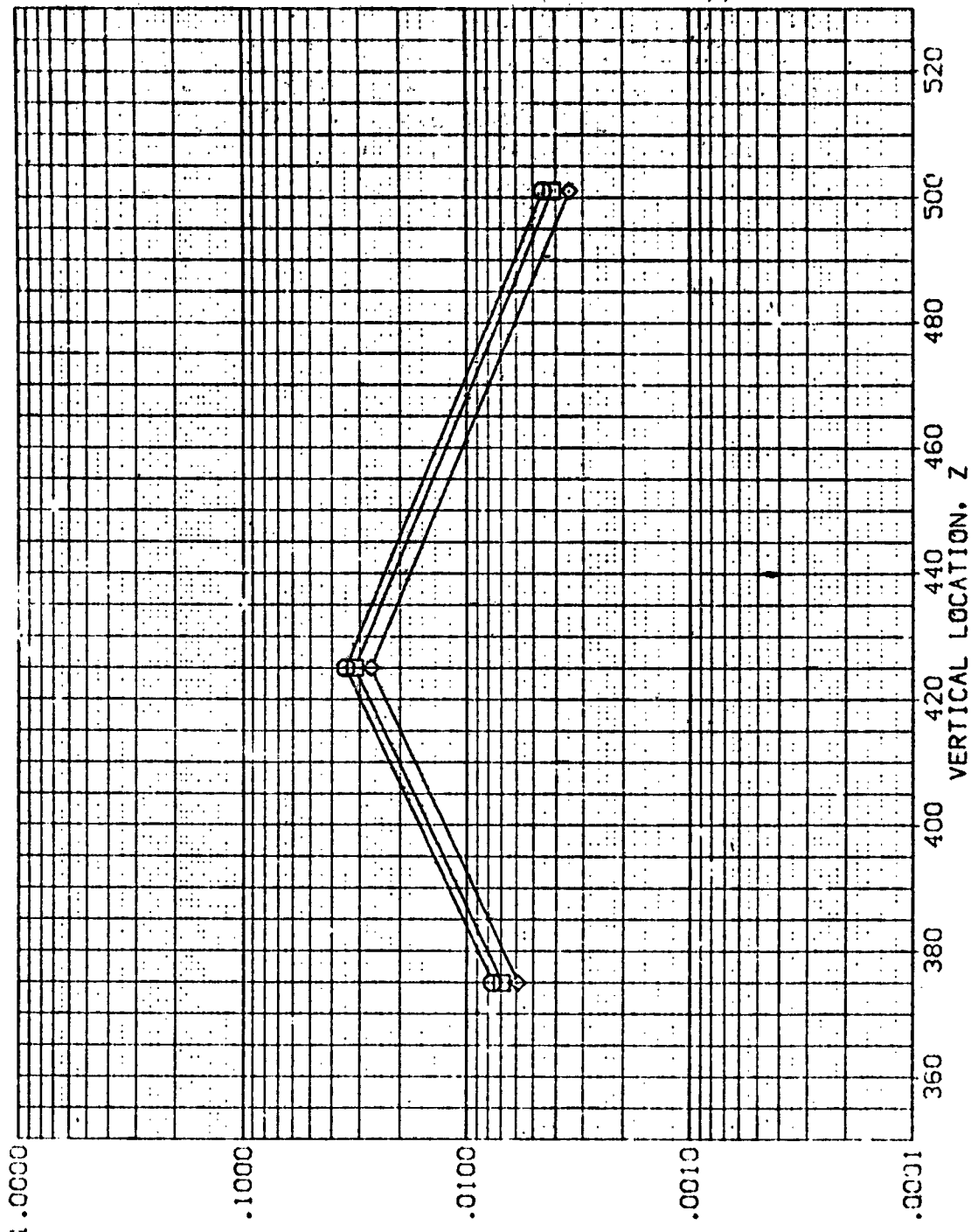


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB03)

SYMBOL	MAX/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA
◇	.850	.700	5.220	60,000	.000
□	.900			1,000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

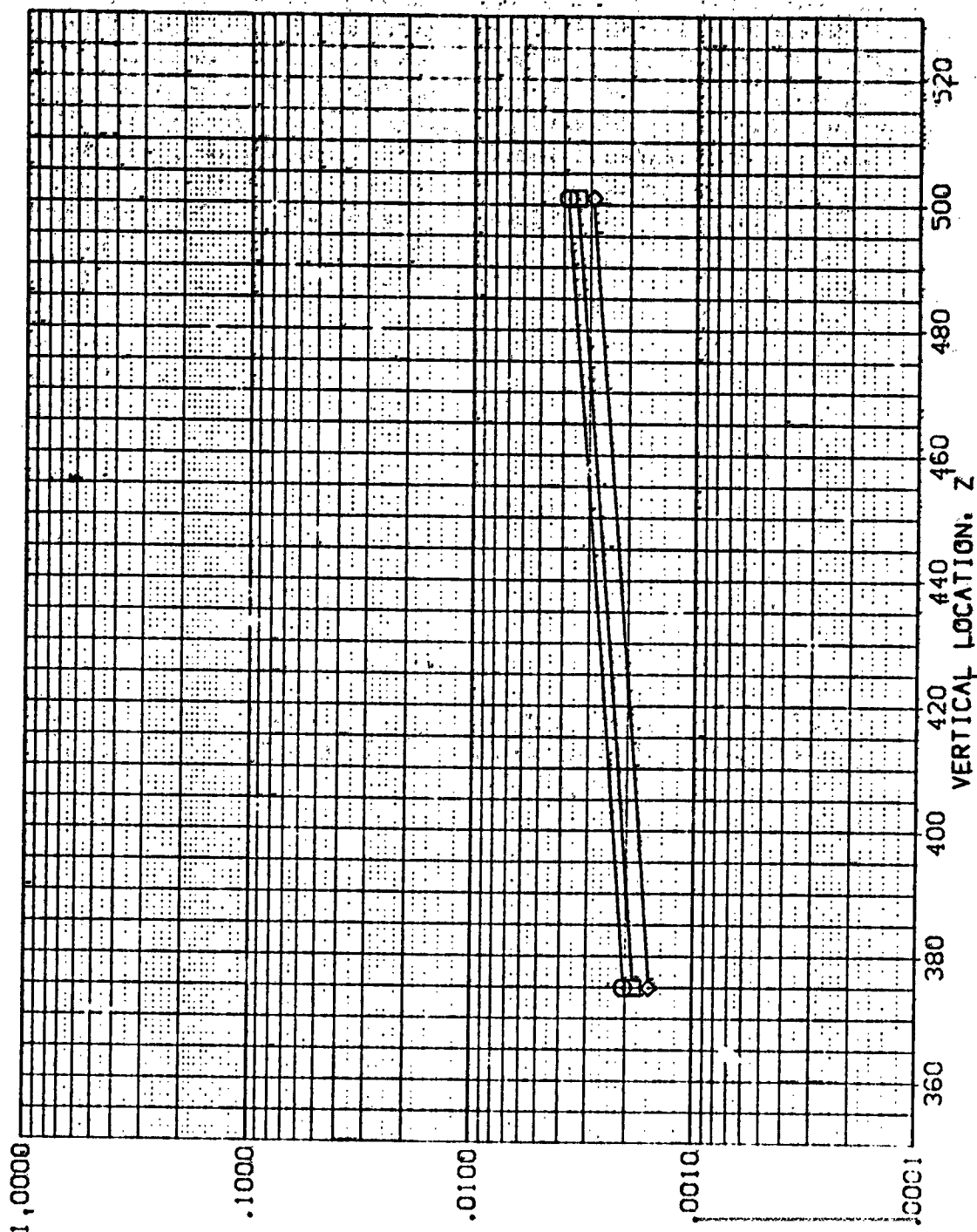


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB04)

SYMBOL:  $\diamond$   $\square$   $\circ$   
 HAWAHT: .850  
 X/L: .300  
 MACH: 5.219

PARAMETRIC VALUES  
 ALPHA: 90.000  
 BETA: 1.000  
 RV/L: .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

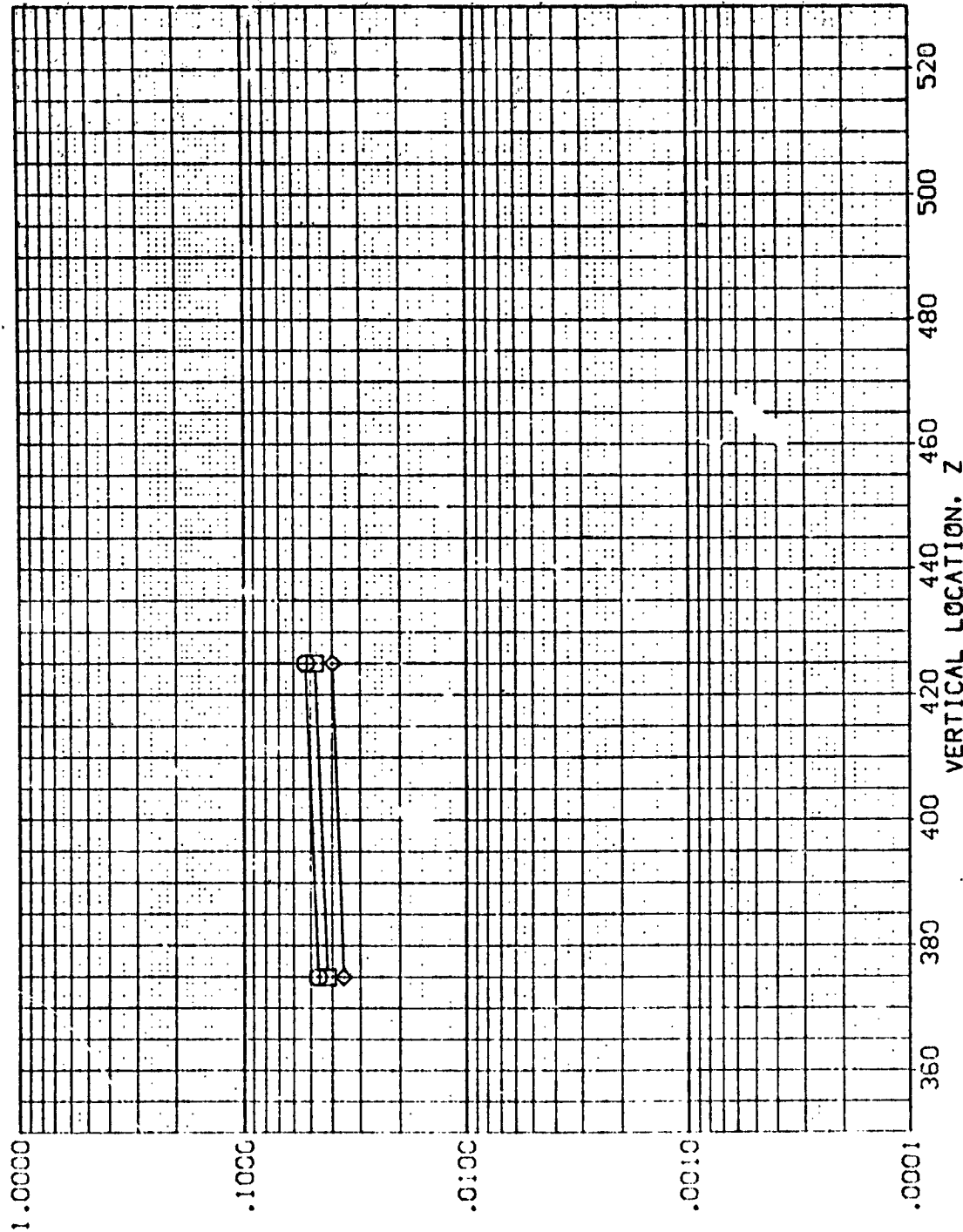


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB04)

SYMBOL	HAY/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	.850	.400	5.219	90.000	.000
□	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

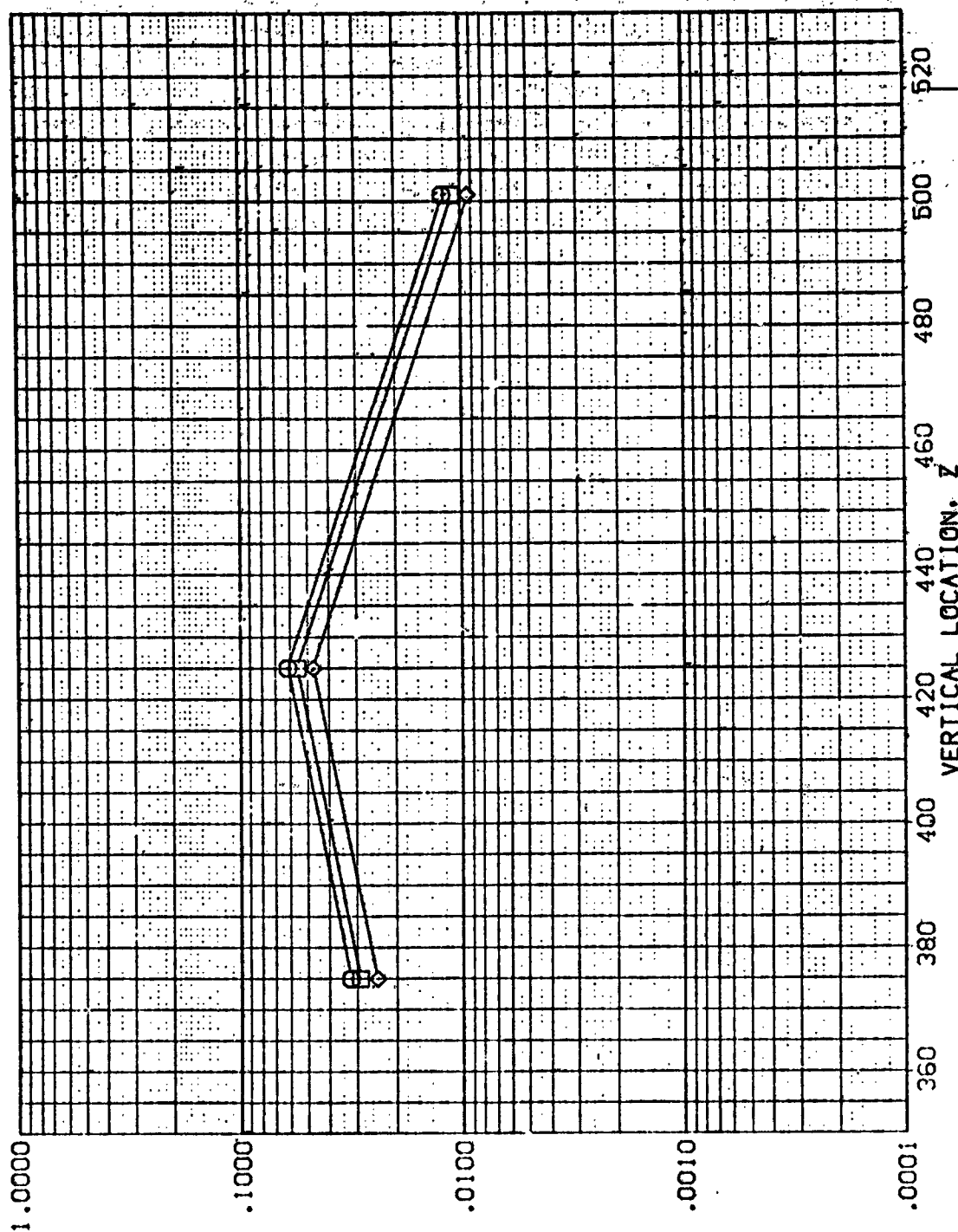


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REV B04)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL  
 HAY/HT  
 X/L  
 MACH  
 1.000  
 .930  
 .850  
 .500  
 5.219

PARAMETRIC VALUES  
 90.002  
 BETA  
 1.000  
 .000

ALPHA  
 RM/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

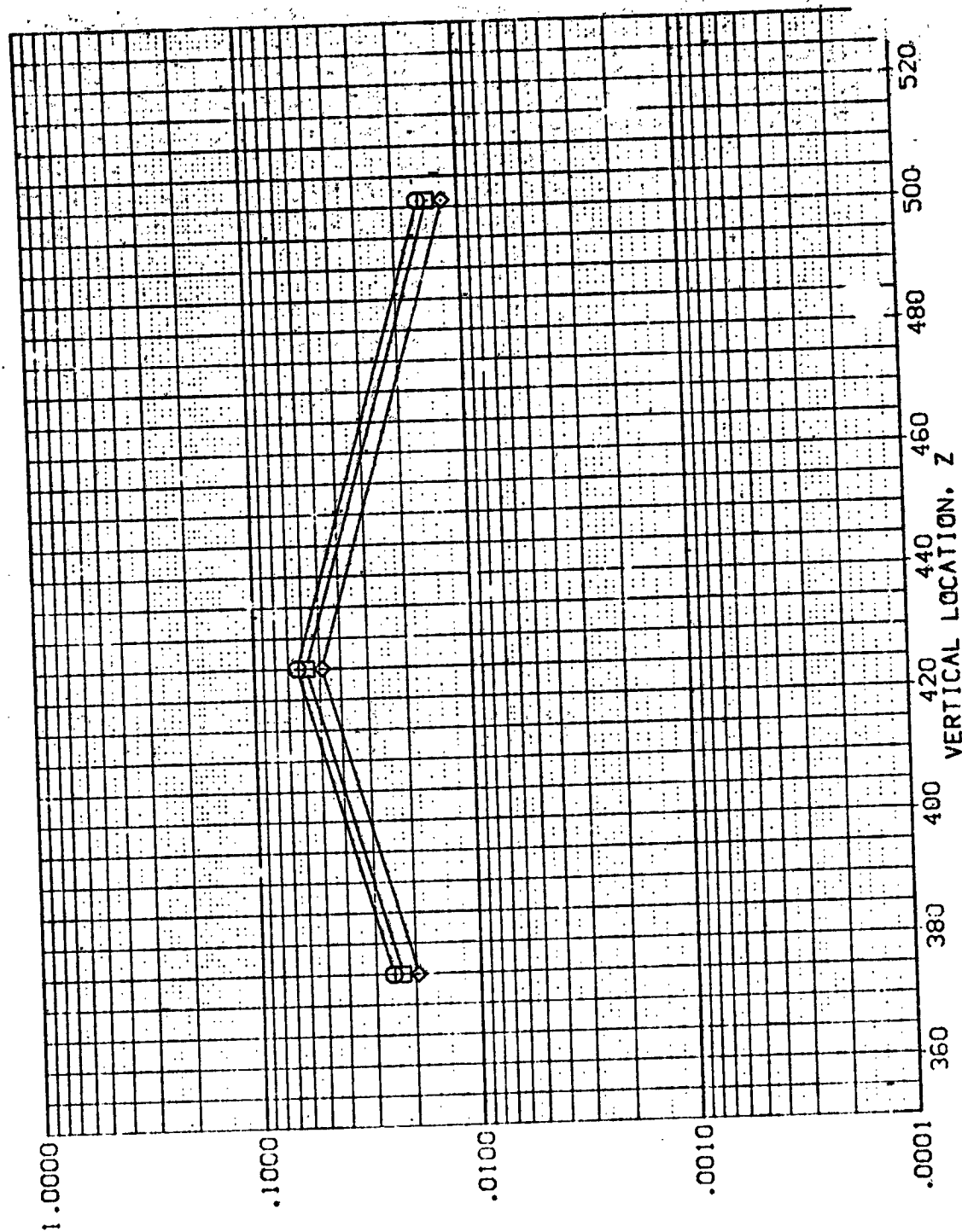


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

REPRODUCED FROM THE  
 ORIGINAL PAGE IN FORM

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REV804)

SYMBOL	HAY/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RV/L	BETA
○	.850	.600	5.219	90.000	.000
◇	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

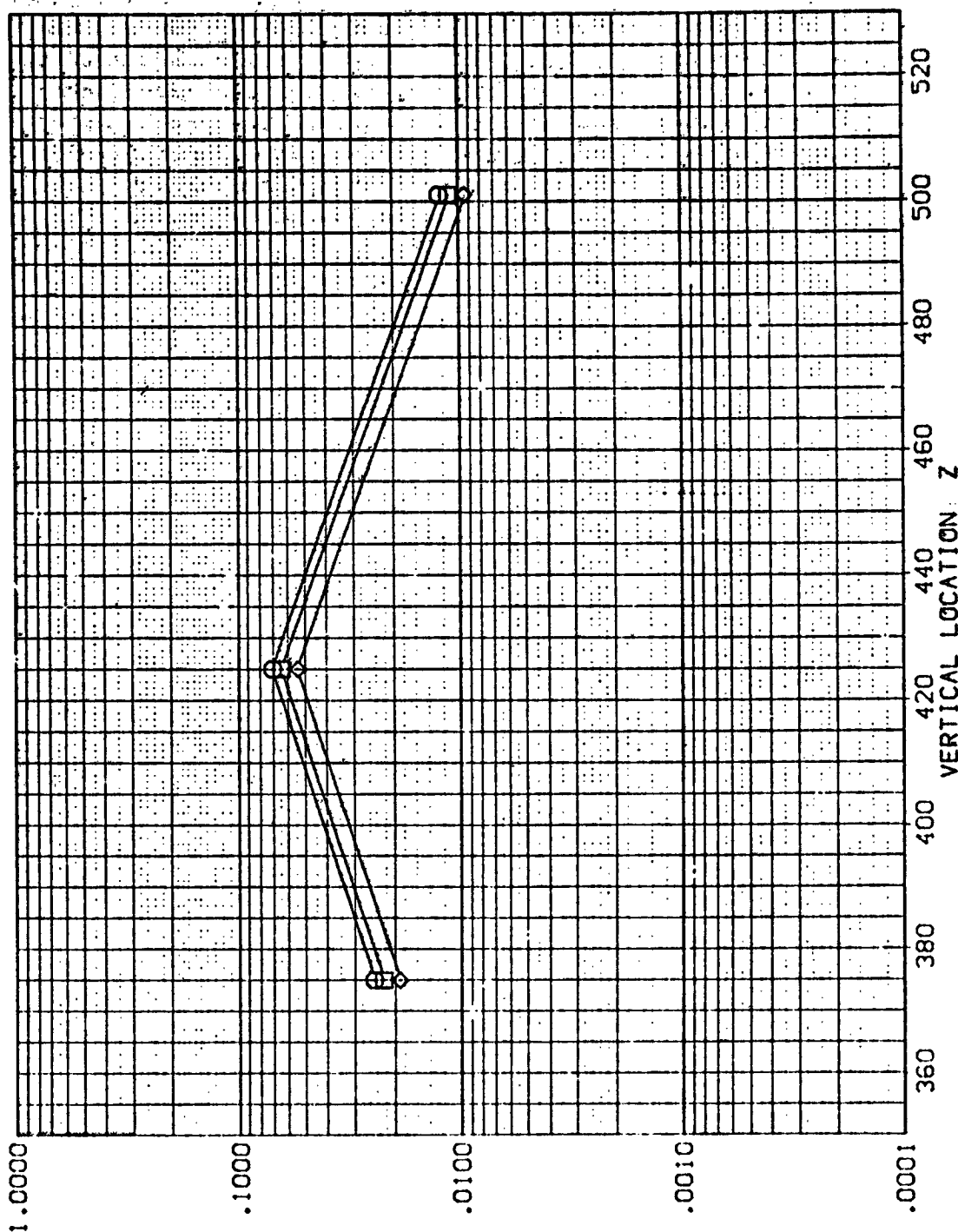


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

SYMBOL  $\diamond$   $\square$   $\circ$   $\triangle$

PARAMETER X/L MACH

.850 .700 5.219

.900

1.000

PARAMETRIC VALUES

ALPHA RN/L 90.000 1.000

BETA .500

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

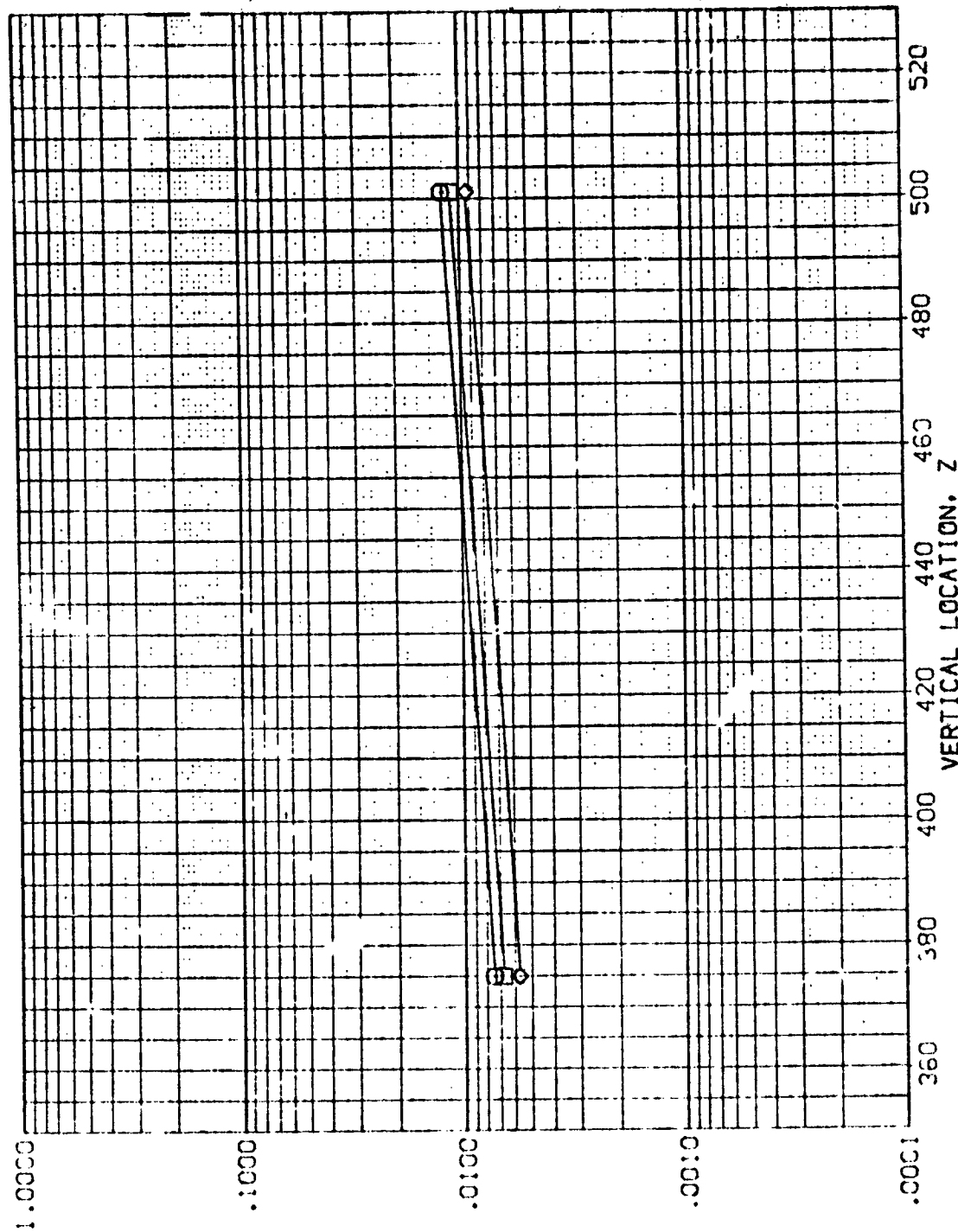


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB05)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	.850	.300	5.220	120.000	.0000
□	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

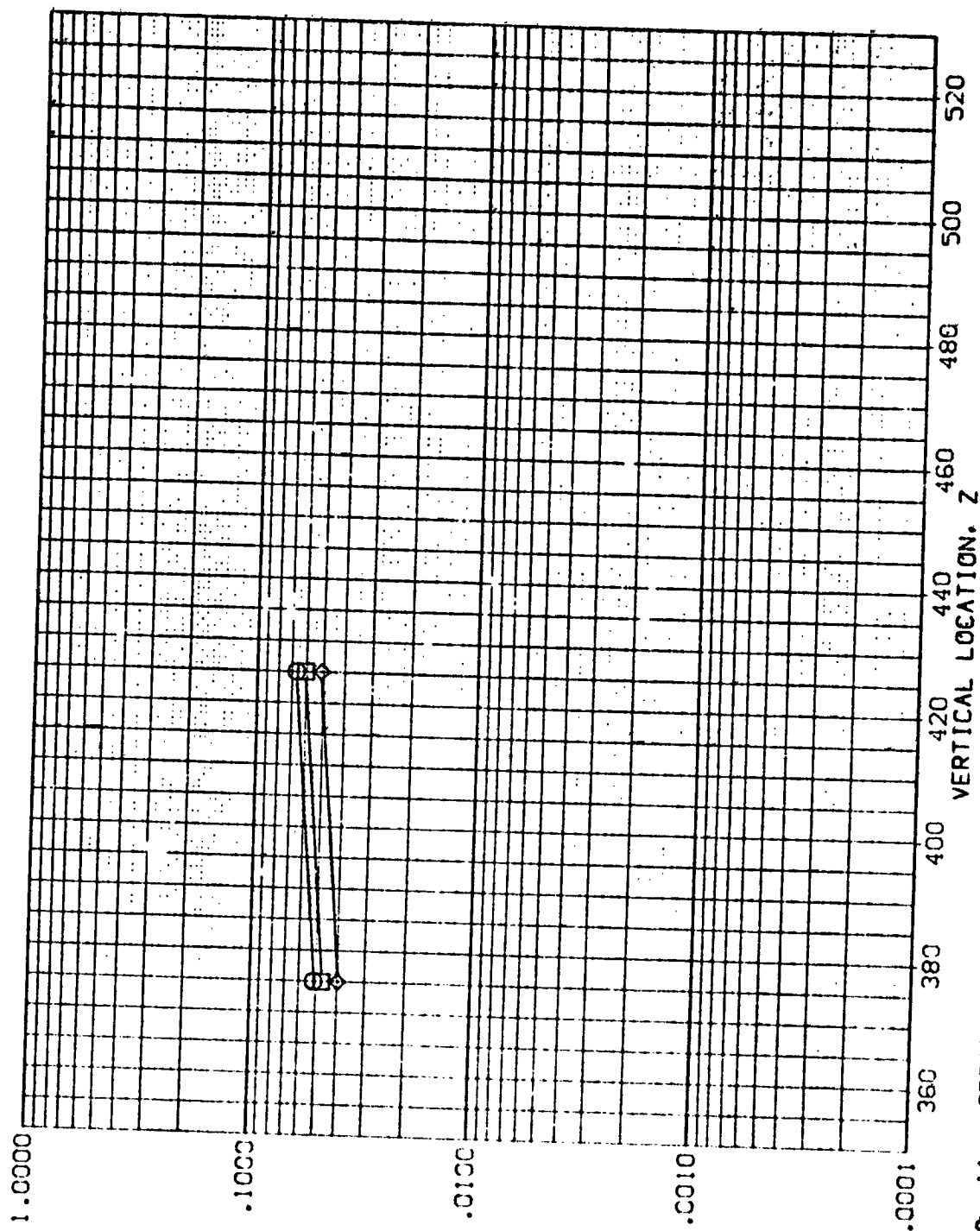


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REV B05)

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 RN/L 1.000

SYMBOL HAV/MT X/L MACH  
 □ .850 .400 5.220  
 □ .930  
 ◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

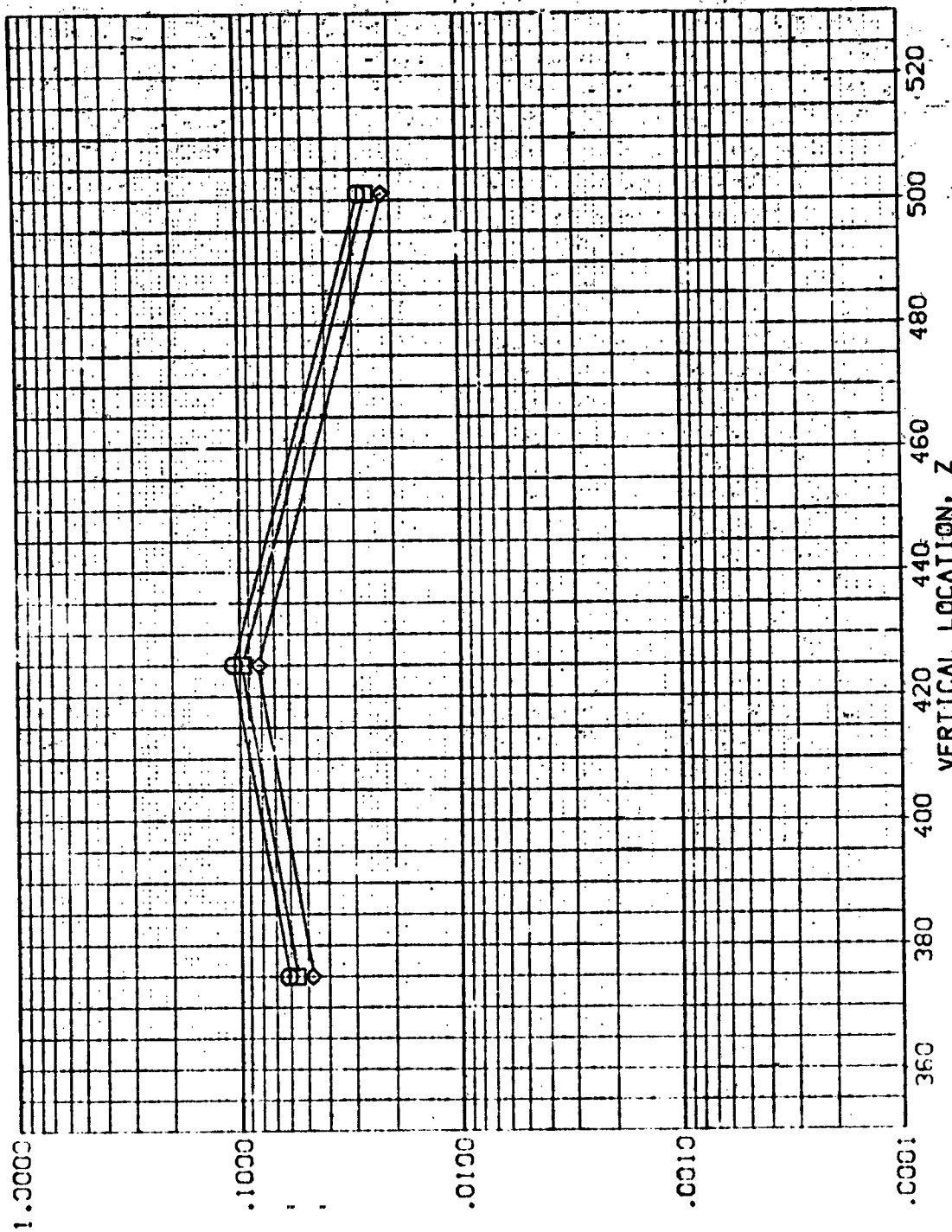


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB05)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA
◇	.850	.500	5.220	120.000	.000
◇	.900			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

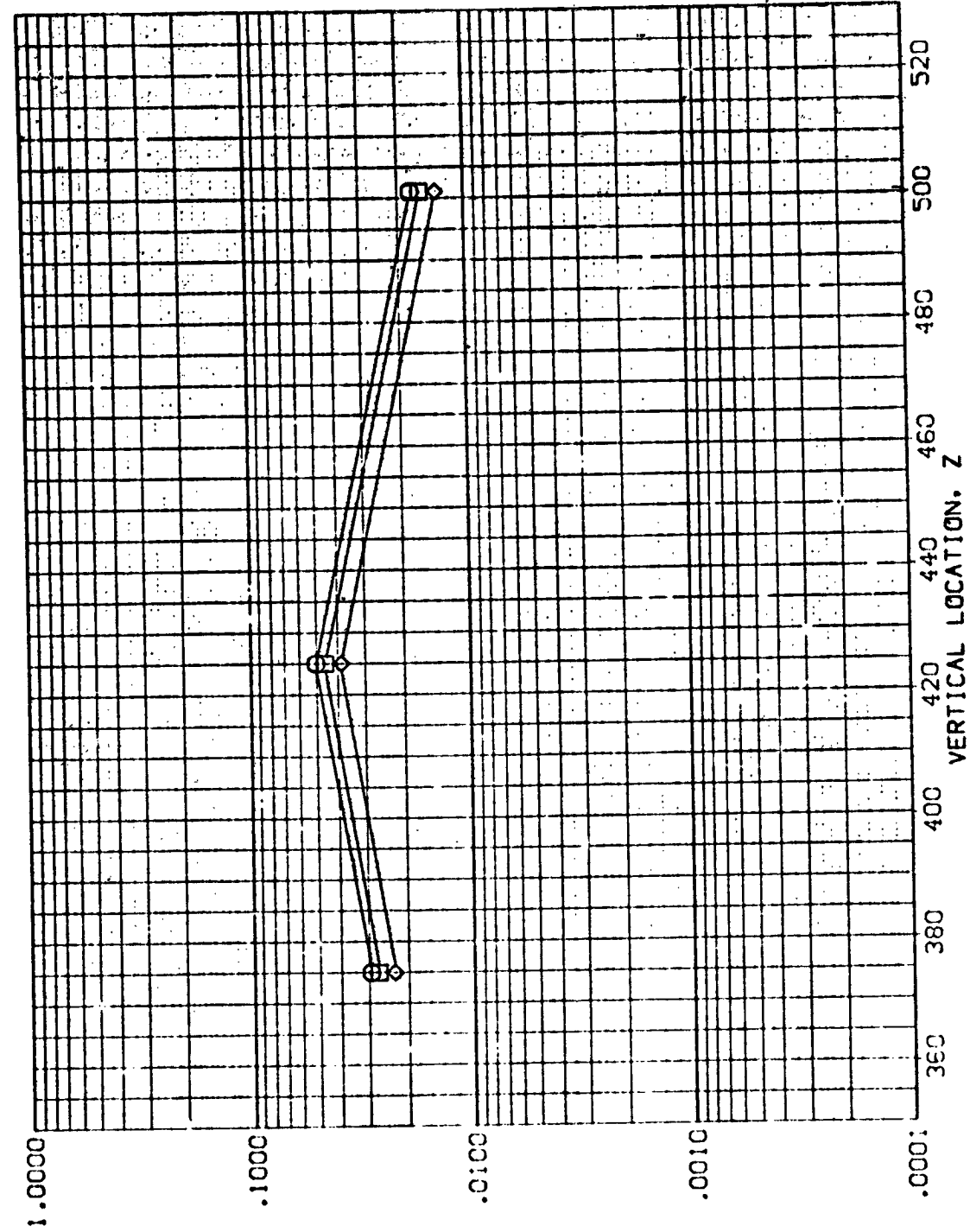


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



SYMBOL HAW/HT X/L MACH  
 .850 .600 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .500  
 RH/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

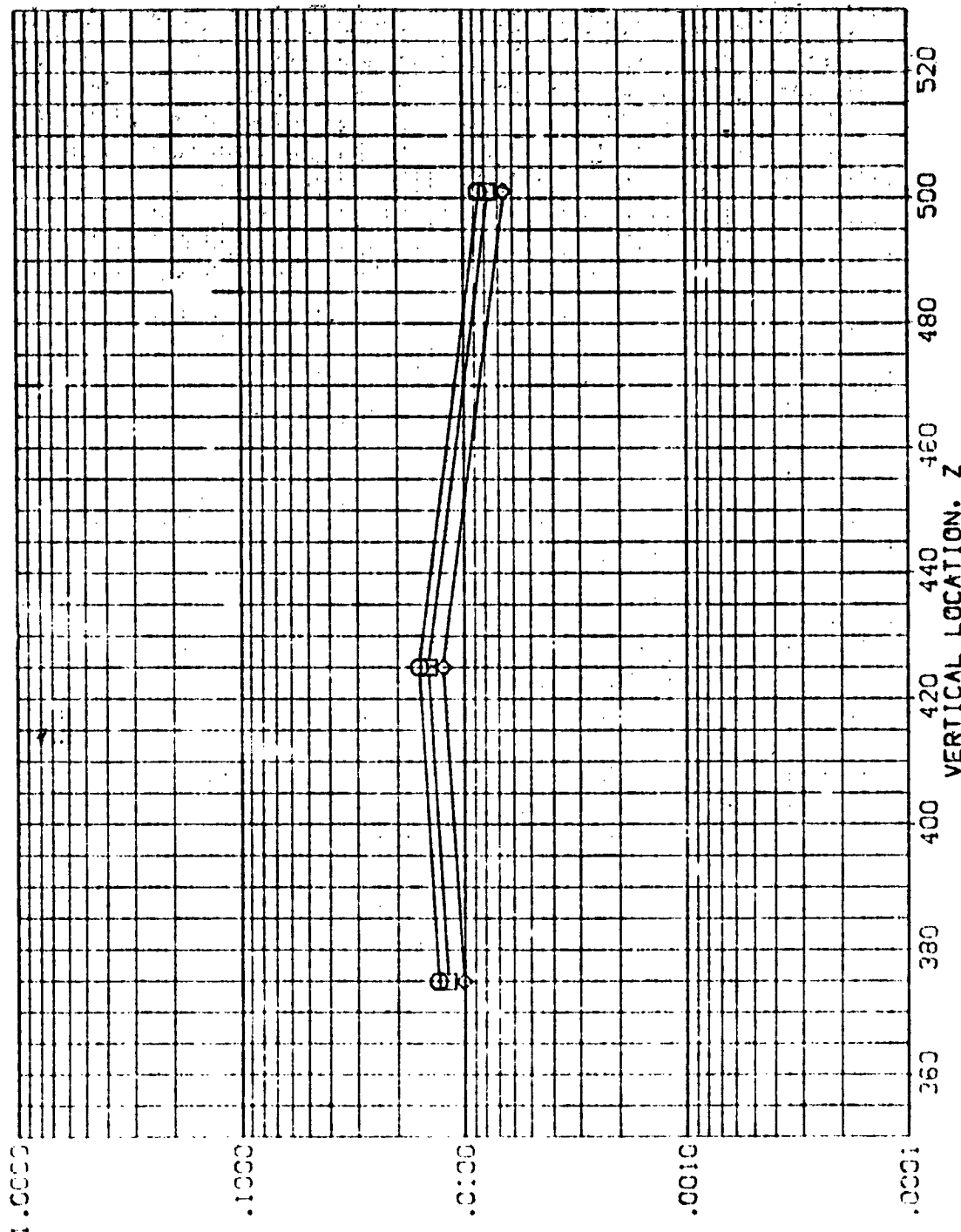


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AVES 3.5-.95 IH28 01+T1 BODY SIDEWALL

(REVB05)

SYMBOL	HAW/HT	K/L	PACH	PARAMETRIC VALUES	
				ALPHA	BETA
				RN/L	
◇	.850	.700	5.220	120.000	1.000
□	.900				
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

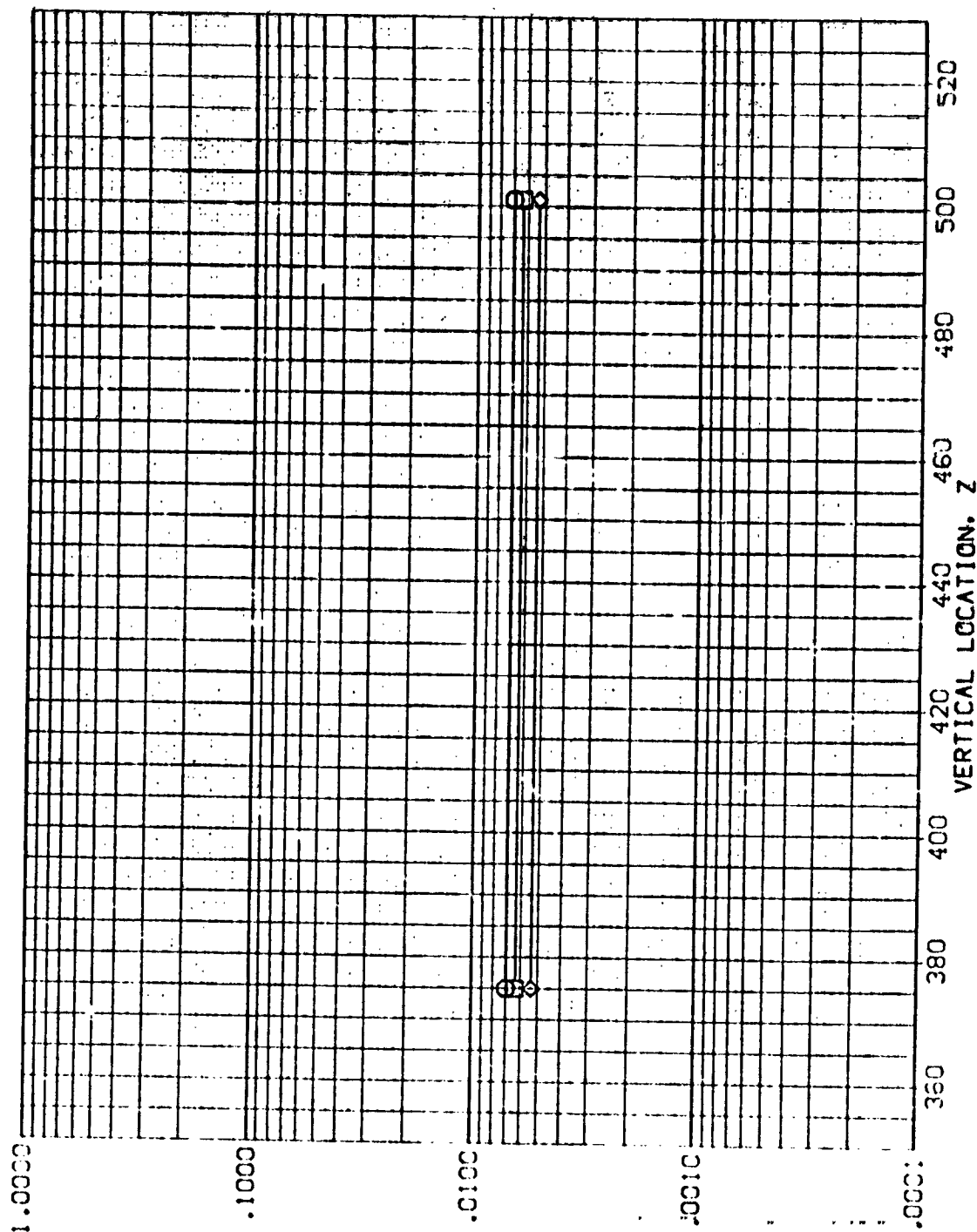


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1-28 01+T1 BODY SIDEWALL

(REV 956)

STRESS  
 H/W  
 .850  
 .900  
 1.000

A/L  
 .300  
 MACH  
 5.220

PARAMETRIC VALUES  
 ALE-A  
 PVAL  
 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

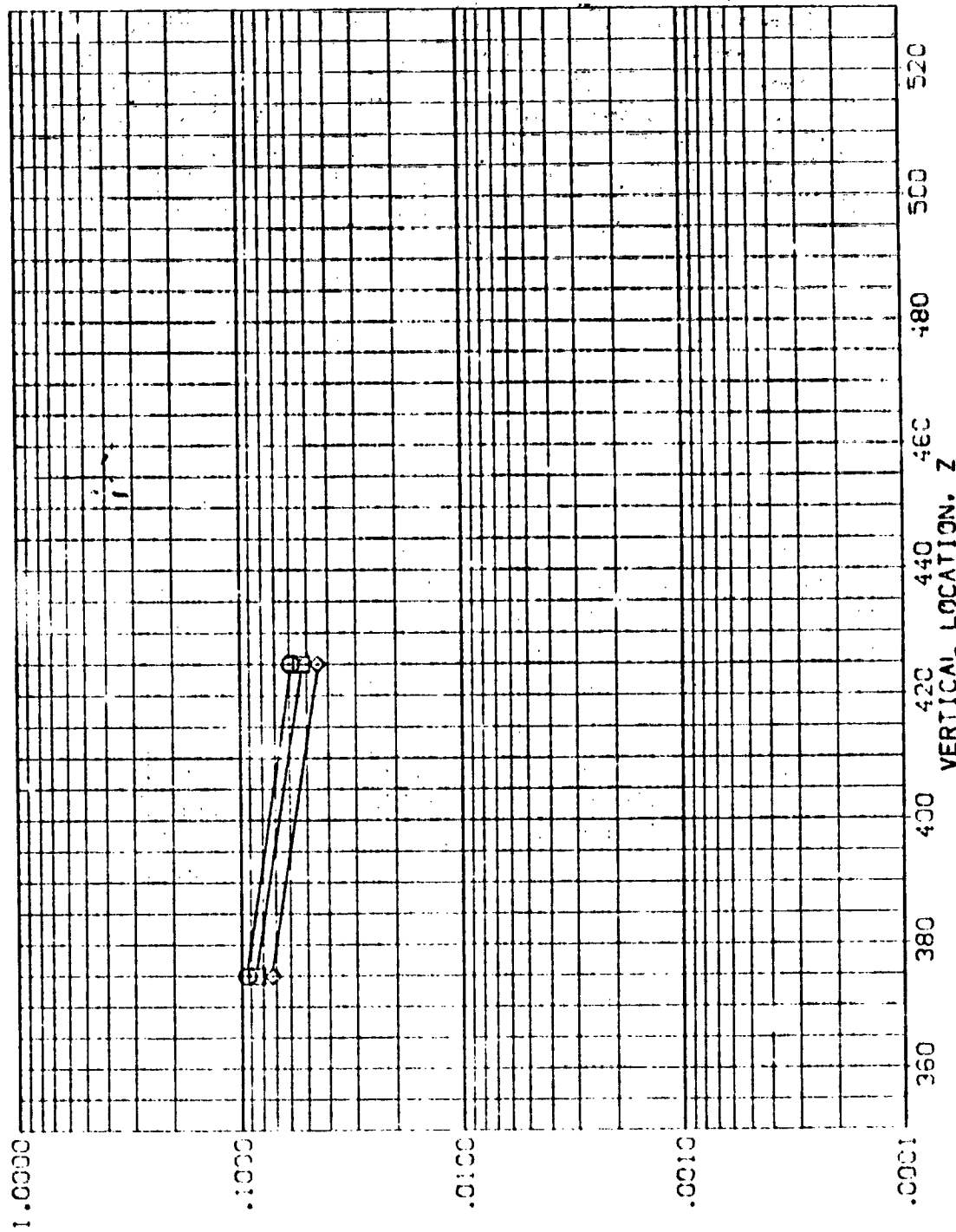


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB06)

SYMBOL    HAW/HT    X/L    MACH  
 ◊    .850    .400    5.220  
 ◻    .900  
     1.000

PARAMETRIC VALUES  
 ALPHA    BETA  
 RN/L    1.000    .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

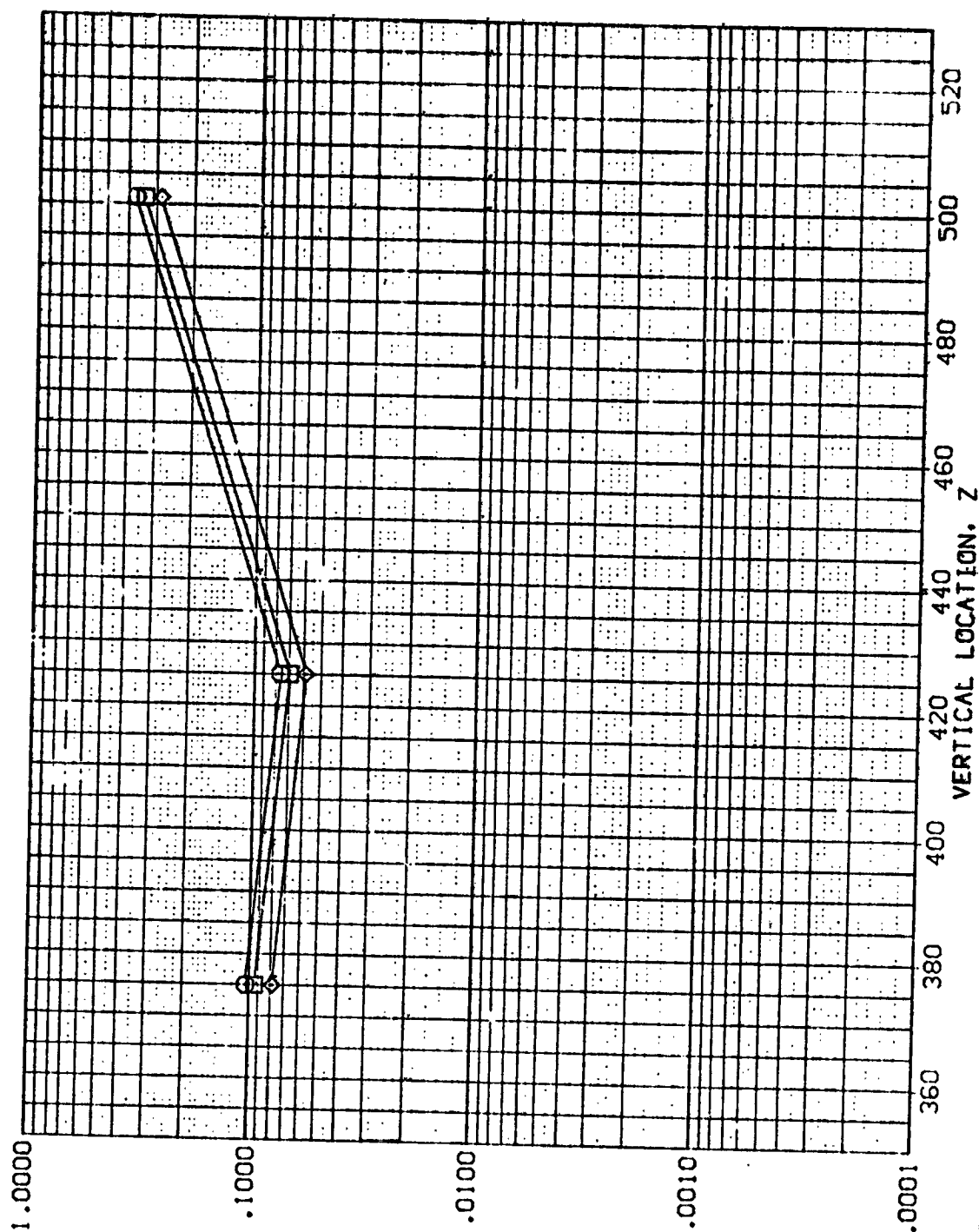


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 RN/L 1.000

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .500 5.220  
 ○ .900  
 □ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

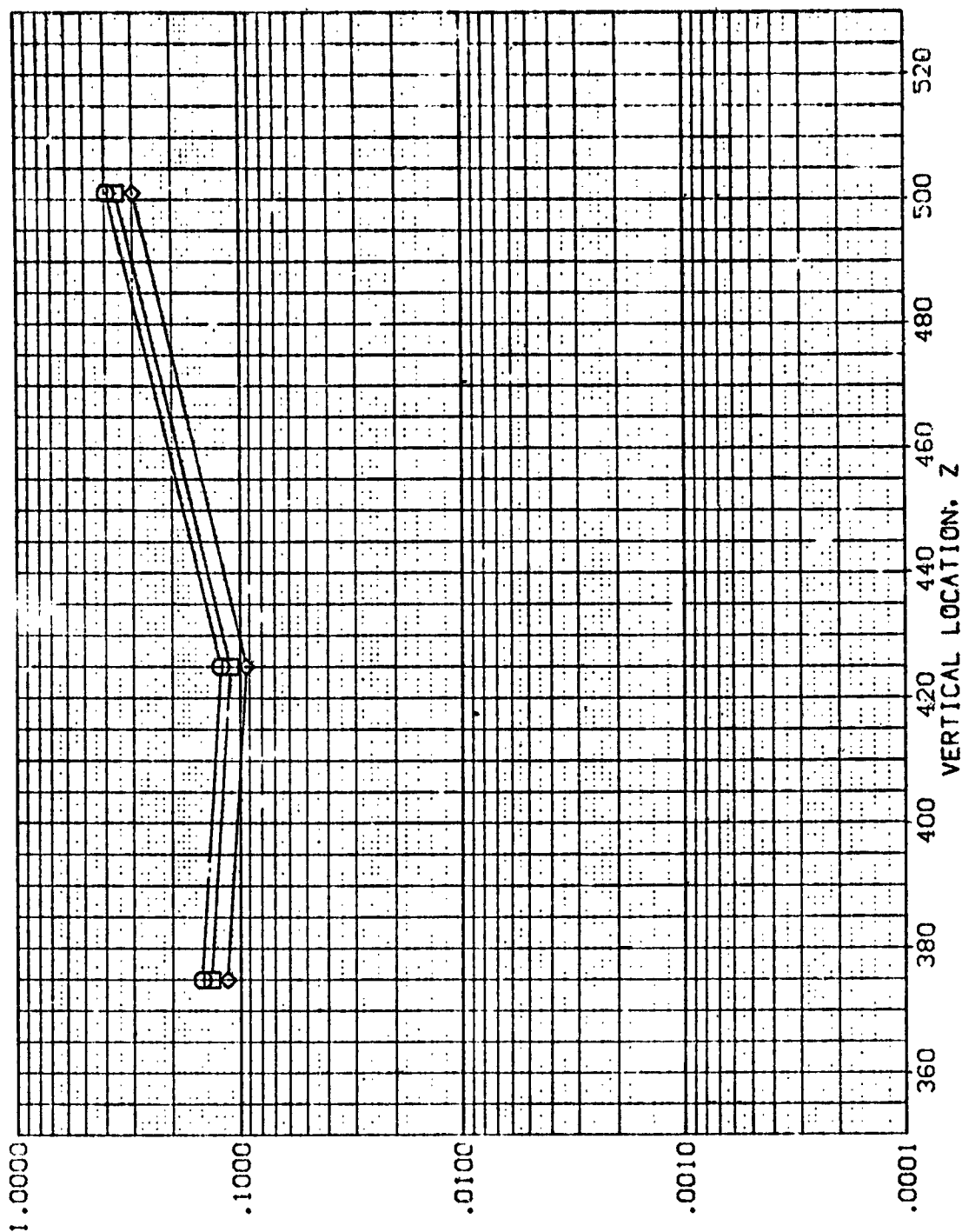


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

REPRODUCED FROM THE  
 ORIGINAL PAGE IS FOR

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB06)

SYMBOL    MAX/HT    X/L    MACH    PARAMETRIC VALUES  
           .850    .600    5.220    ALPHA    BETA  
           .900                            RN/L    .000  
           1.000                            .000

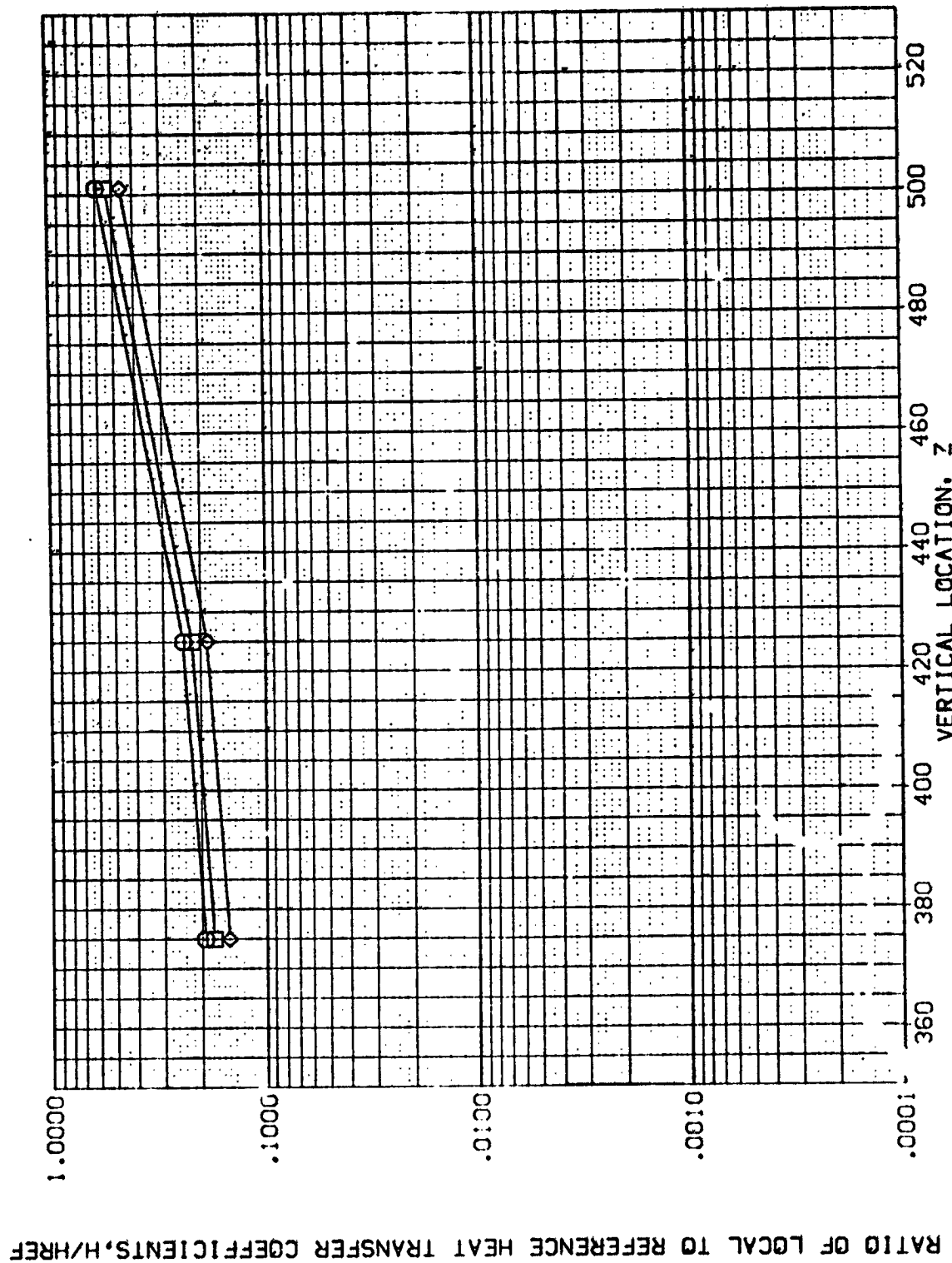


FIG 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5 195 IH28 C1+T1 BODY SIDEWALL

(REVB06)

SYMBOL  
 ◇  
 □  
 ○

HAW/HT  
 .850  
 .900  
 1.000

X/L  
 .700

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 -120.035  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

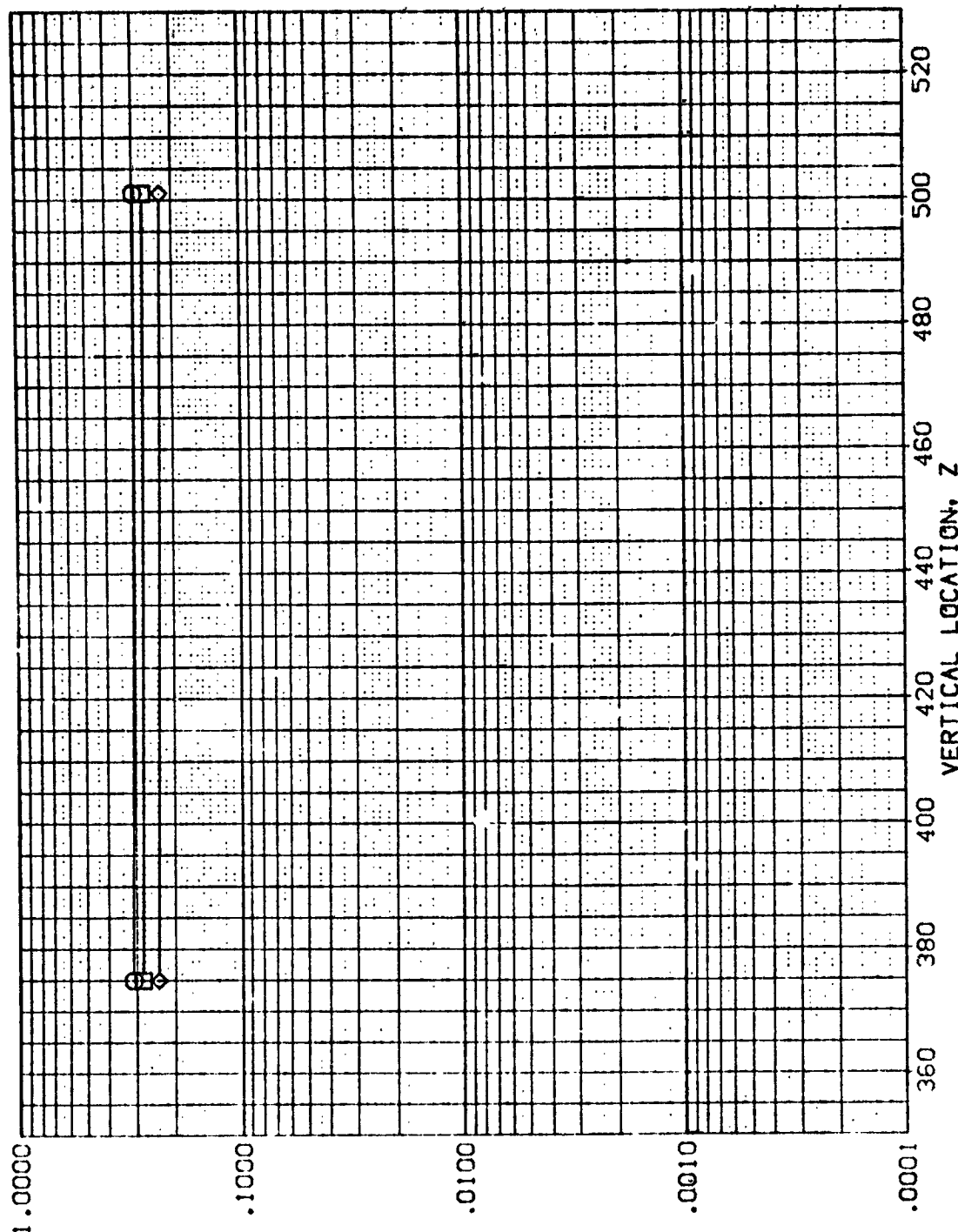


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB07)

SYMBOL	<div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div>	MAV/HT	X/L	MACH	PARAMETRIC VALUES		
		.850	.300	5.219	-90.000	BETA	.000
		.900			1.000		
		1.000					

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

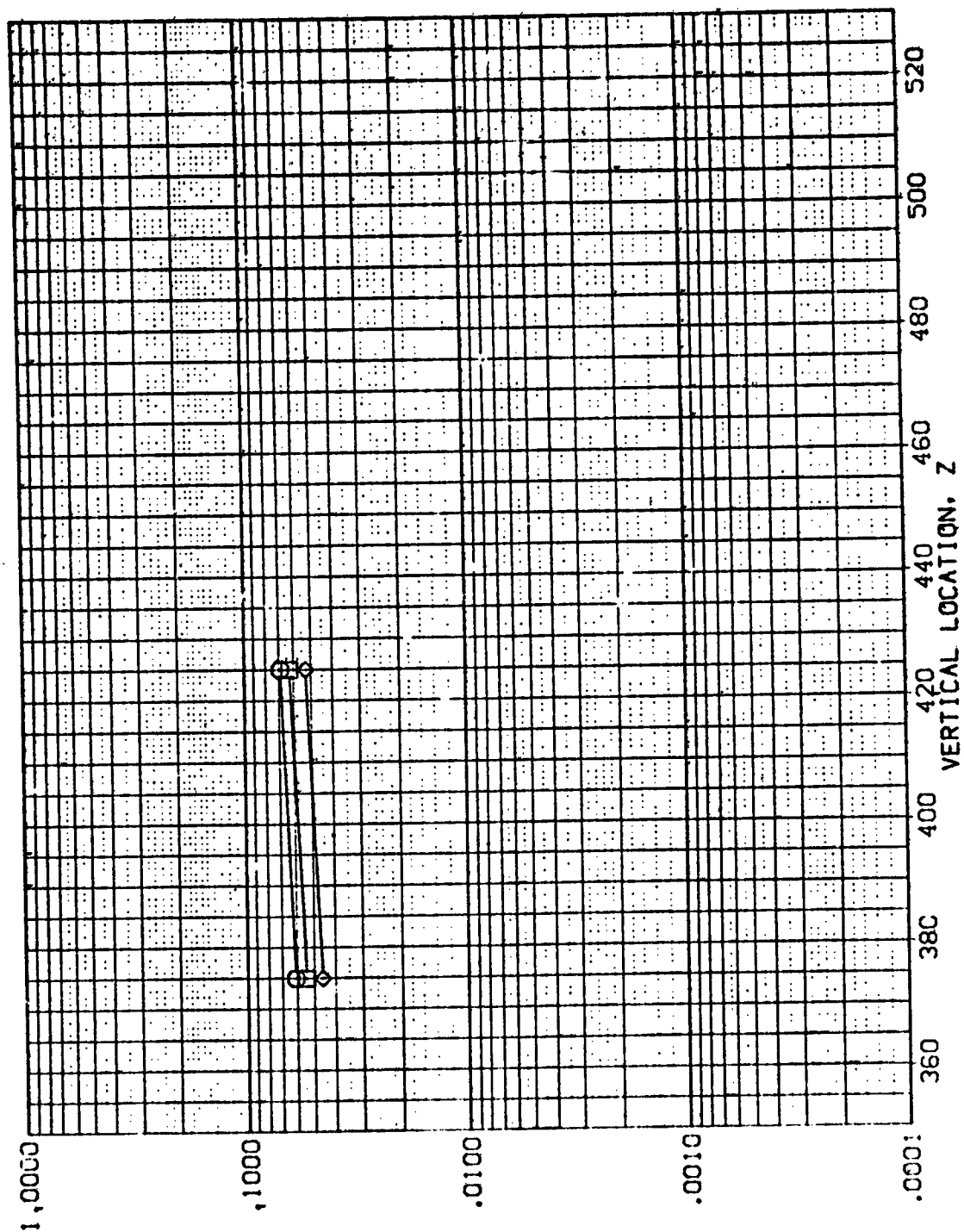


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



SYMBOL

HAIR/HT  
.850  
.900  
1.000

X/L  
.400

MACH  
5.219

ALPHA  
RV/L

PARAMETRIC VALUES  
-90.000 BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

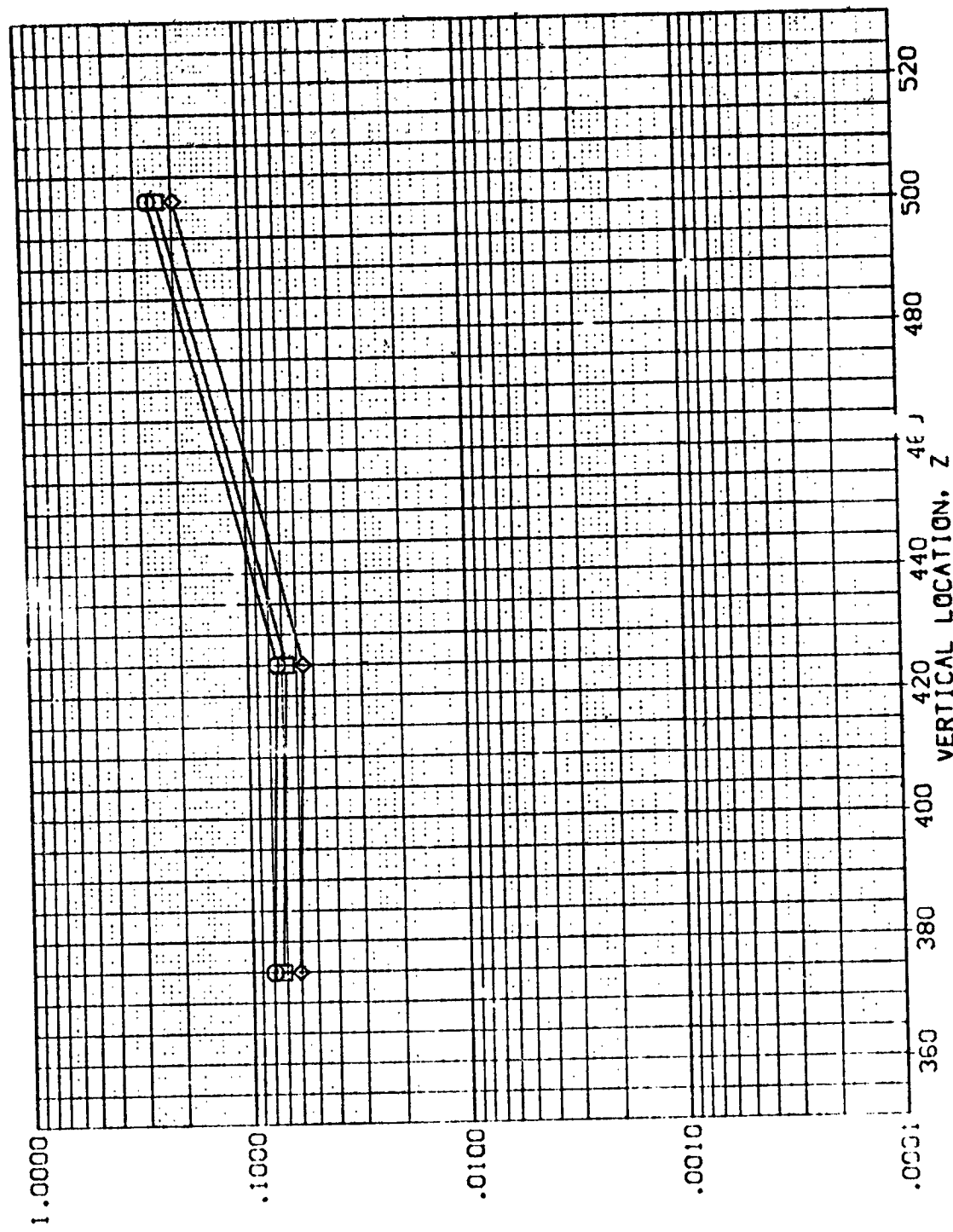


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB07)

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RN/L 1.000

SYMBOL MACH X/L  
 .850 .500  
 .900 .500  
 1.000 .500

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

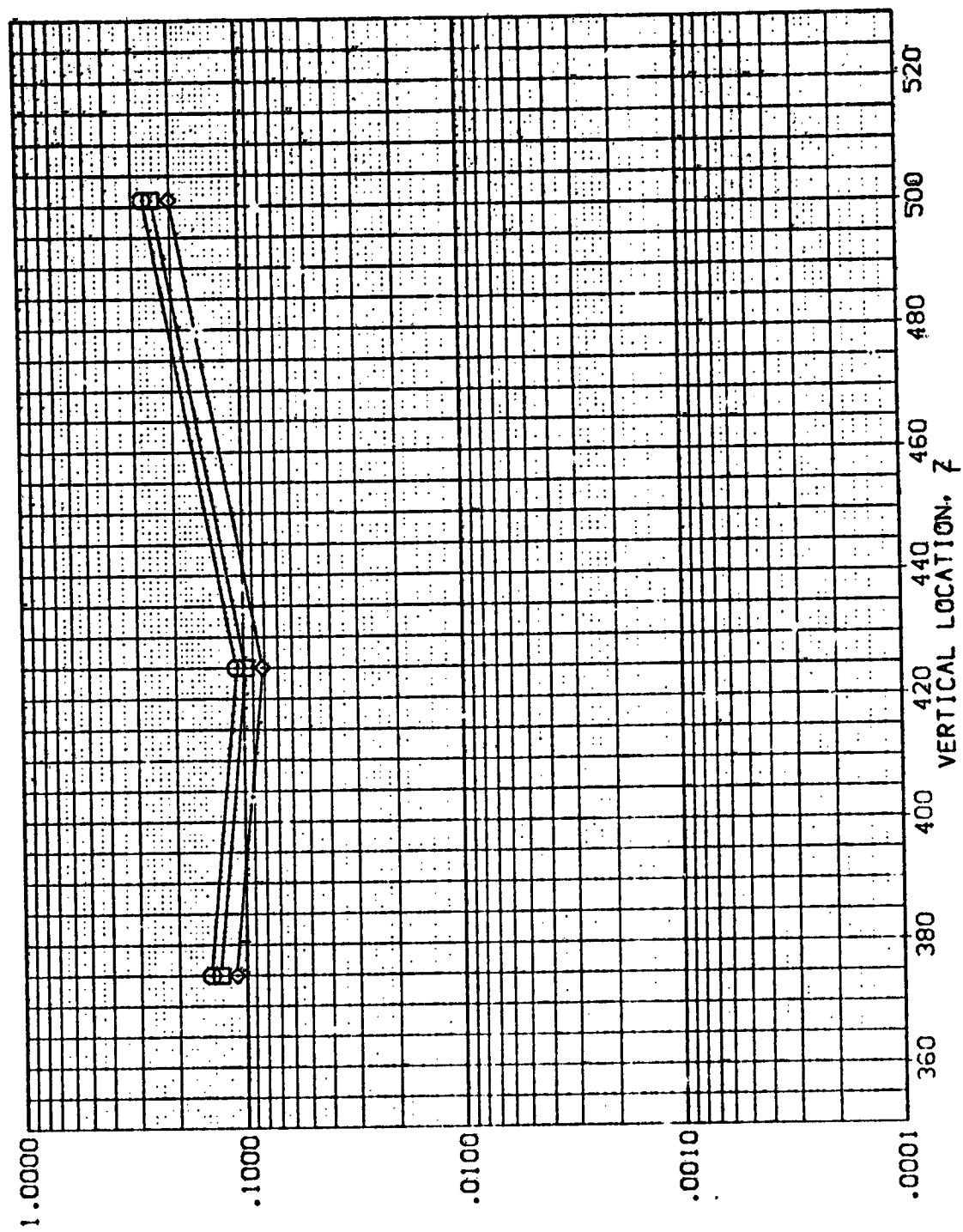


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1428 01+T1 BODY SIDEWALL

(REVB07)

SYMBOL  
 ◇  
 □  
 ○

MAW/HT  
 .850  
 .900  
 1.000

X/L  
 .600

MACH  
 5.219

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 50.000  
 1.000  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

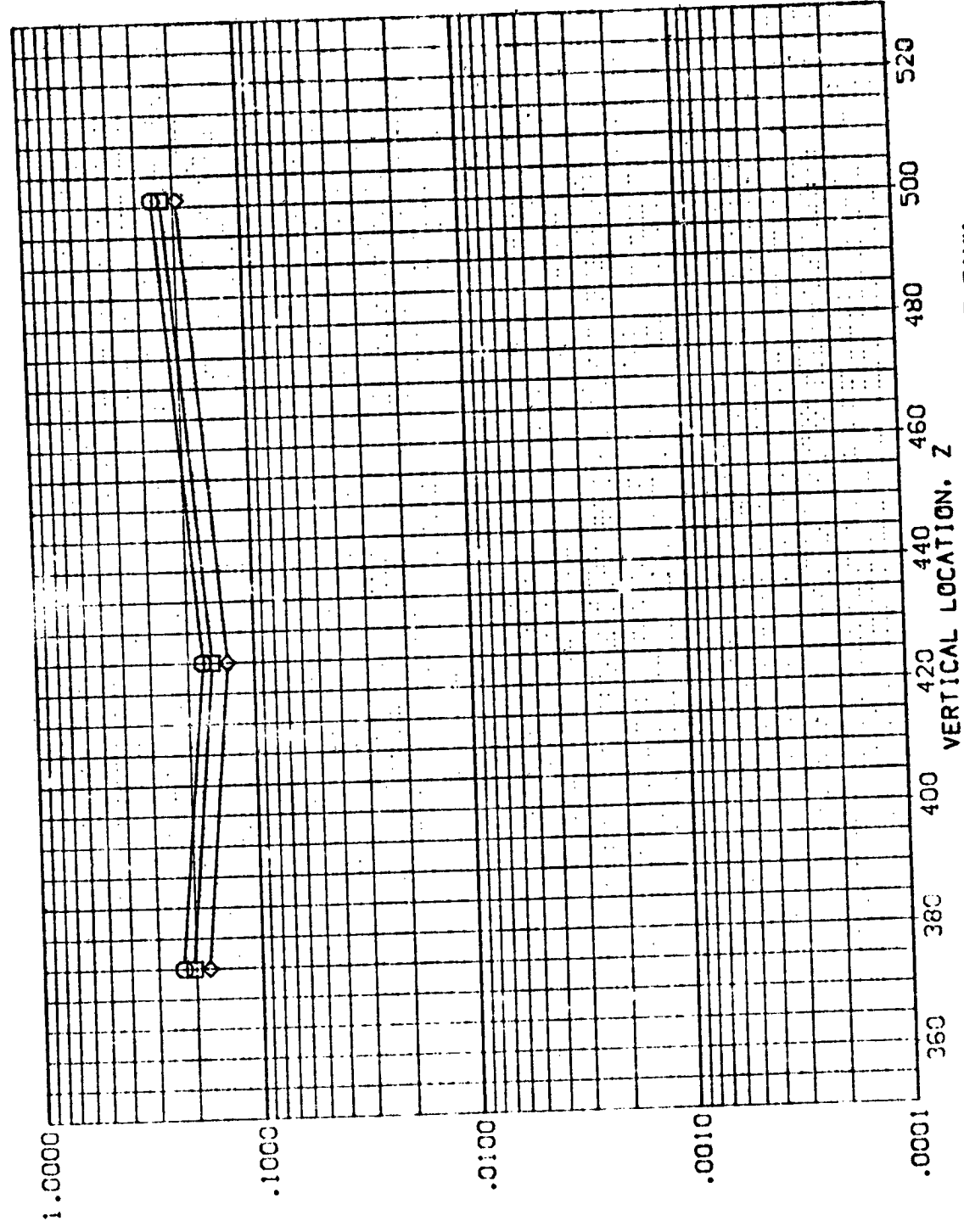


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REV807)

SYMBOL MACH X/L  
 .850  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA  
 RN/L  
 BETA  
 .000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

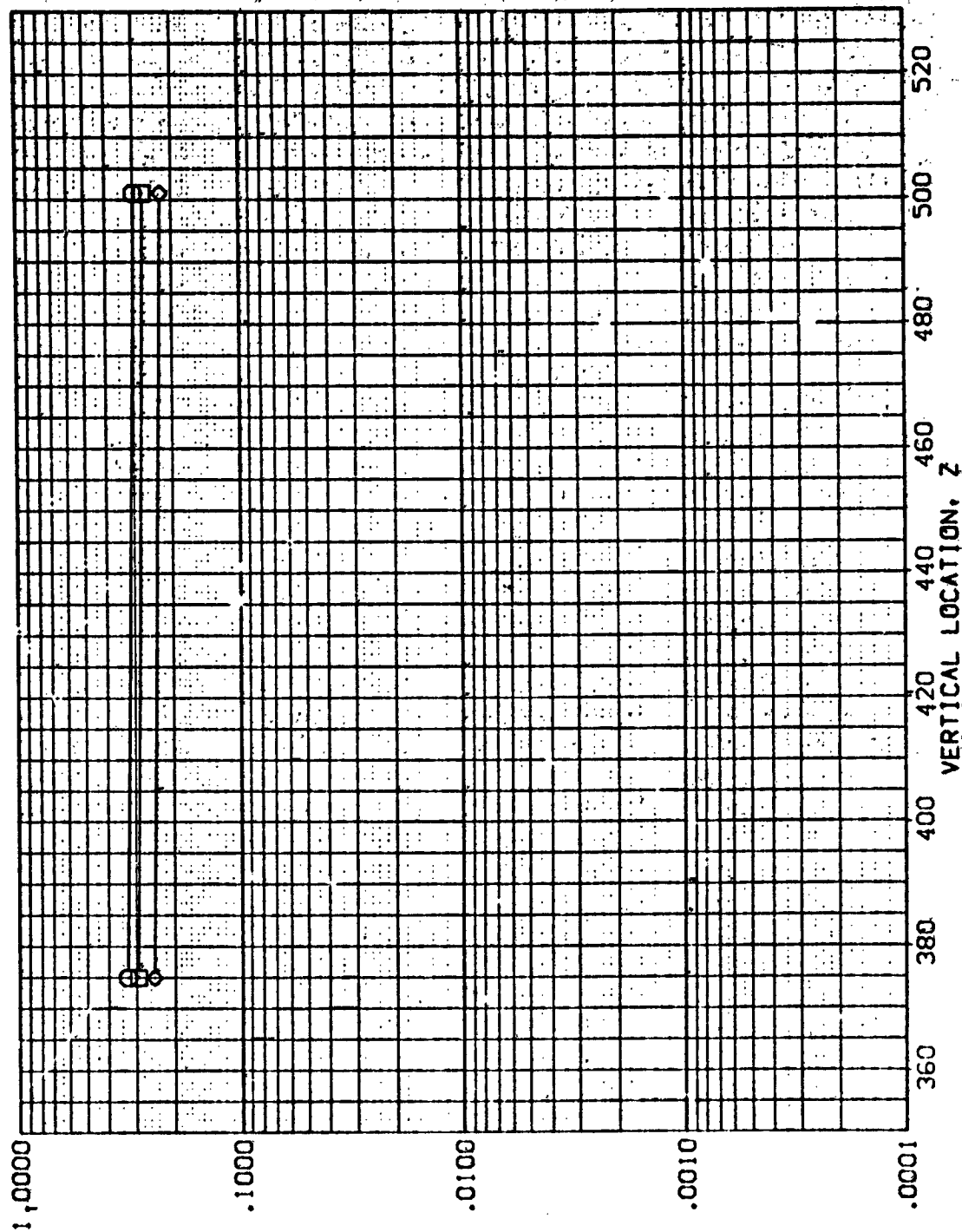


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB08)

SYMBOL  
 □  
 ◇  
 ○

HEIGHT  
 .850  
 .900  
 1.000

X/L  
 .300

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA  
 -60.000  
 BETA  
 1.000  
 RY/L  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

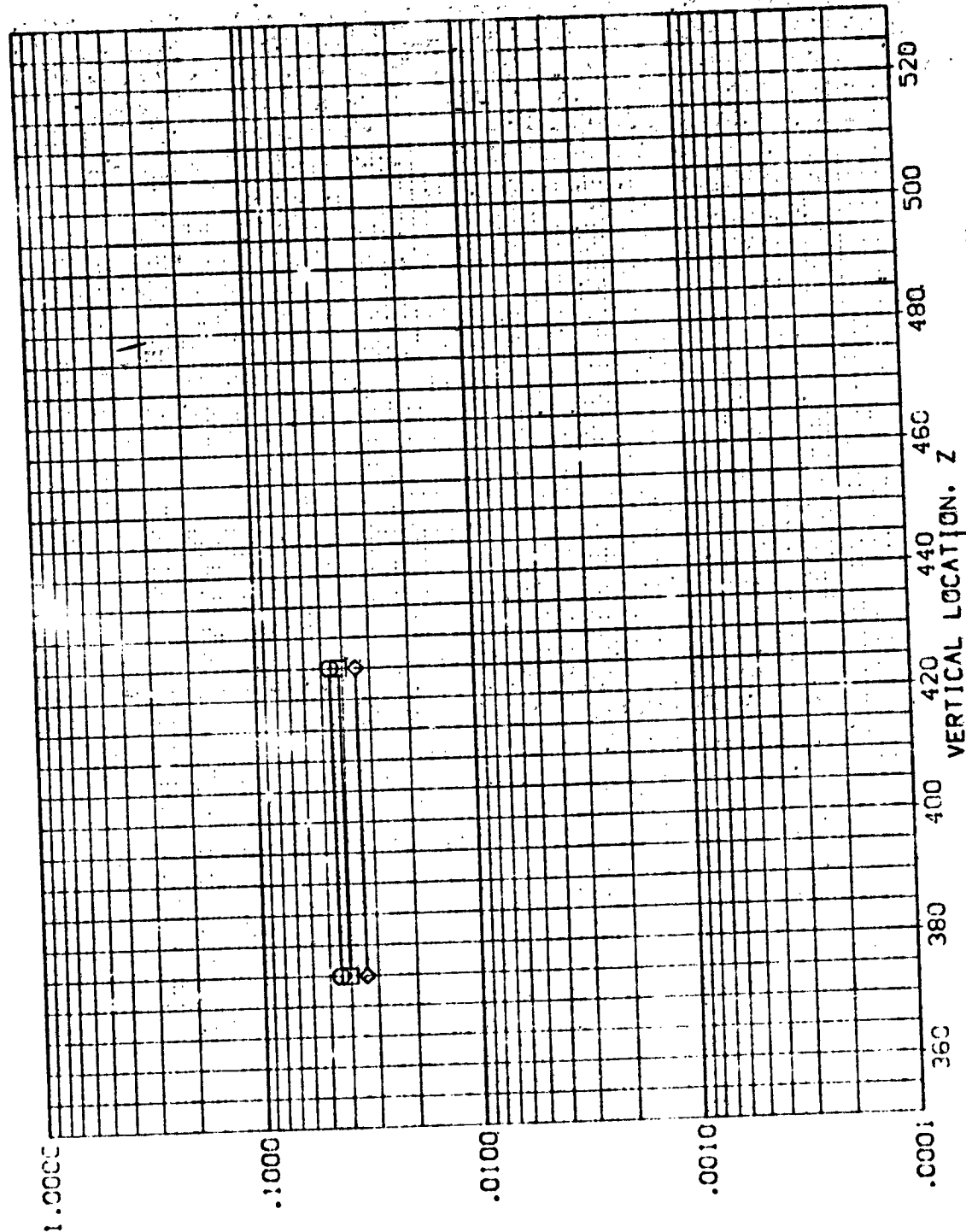


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB08)

SYMBOL	<div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div> <div style="display: inline-block; width: 10px; height: 10px; border: 1px solid black; margin-right: 5px;"></div>	HA/W/HT	X/L	MACH	PARAMETRIC VALUES	
		.850	.400	5.220	ALPHA	BETA
		.900			RN/L	
1.000						

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

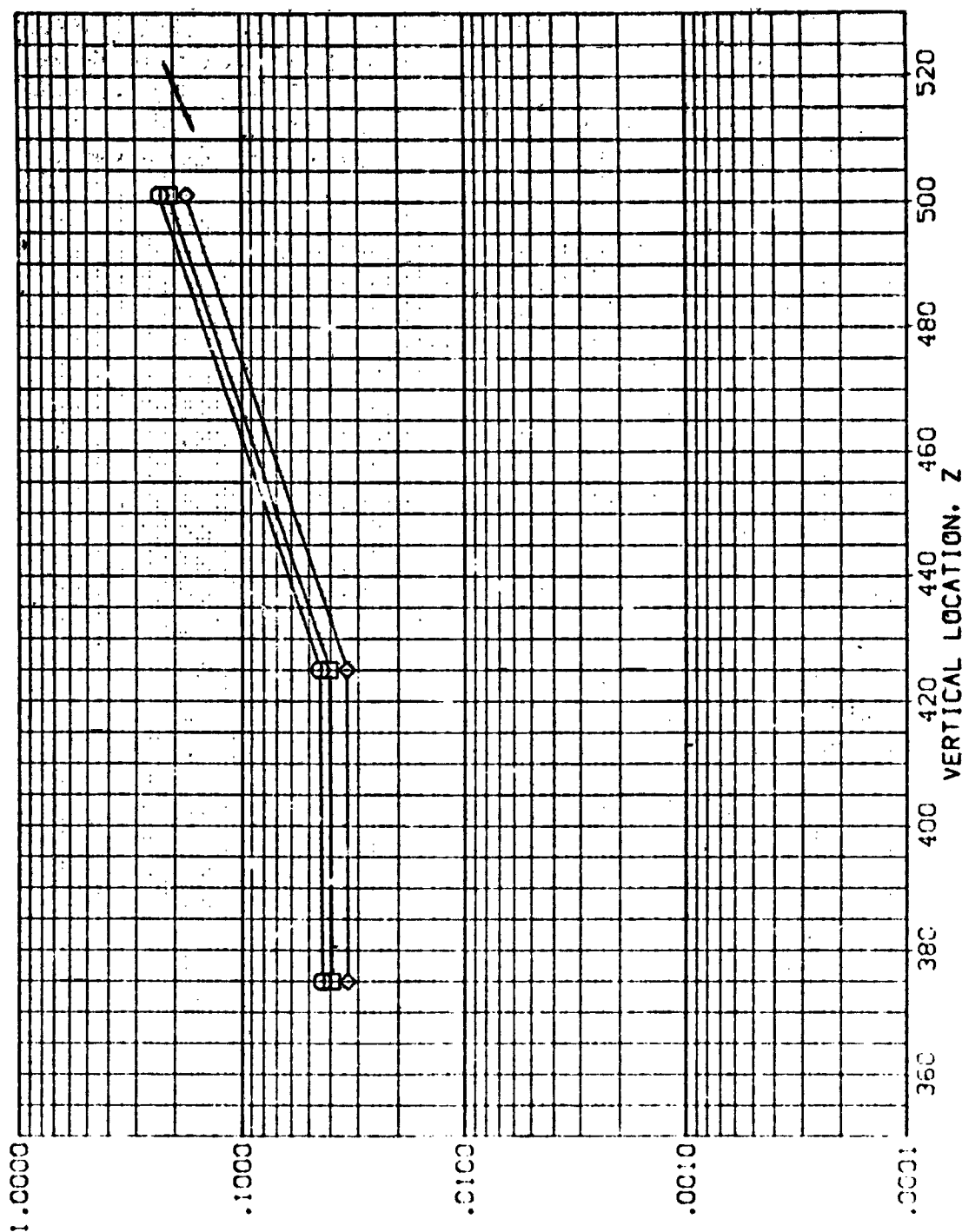


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# ANES 3.5-195 1428 01+T1 BODY SIDEWALL

(REV808)

S/WALL  
 P/WALL  
 X/L  
 MACH  
 .850  
 .500  
 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA  
 -60.000  
 BETA  
 1.000  
 RW/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

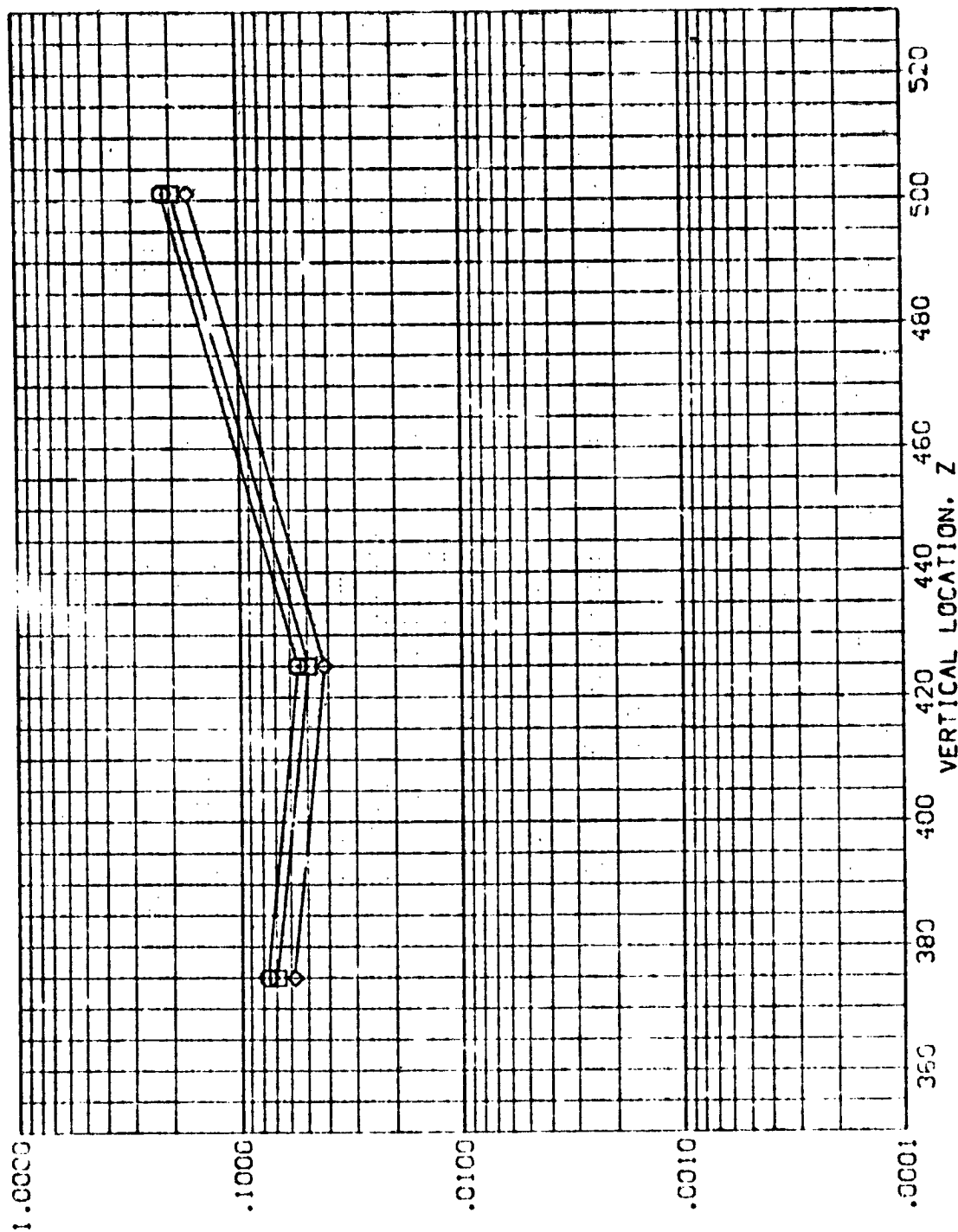


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB08)

SYMBOL

HAU/HT  
.850  
.900  
1.000

X/L  
.600

MACH  
5.220

PARAMETRIC VALUES

ALPHA  
RN/L

50.000  
1.000

BETA

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

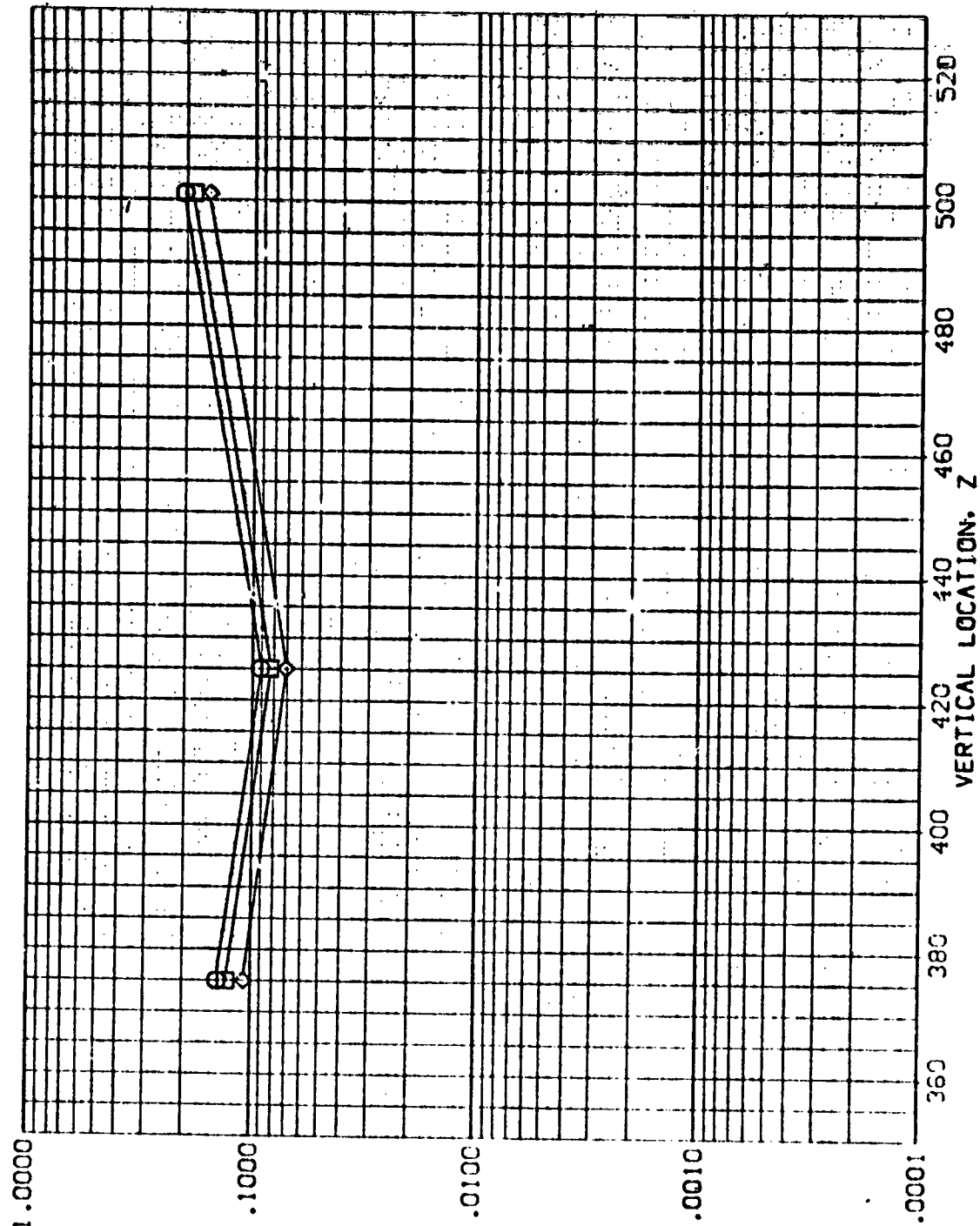


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVISED)

SYMBOL HAW/HT X/L MACH  
 ◇ .850 .700 5.220  
 □ .900  
 ○ 1.000

PARAMETRIC VALUES  
 ALPHA -60.000 BETA .000  
 P/W/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

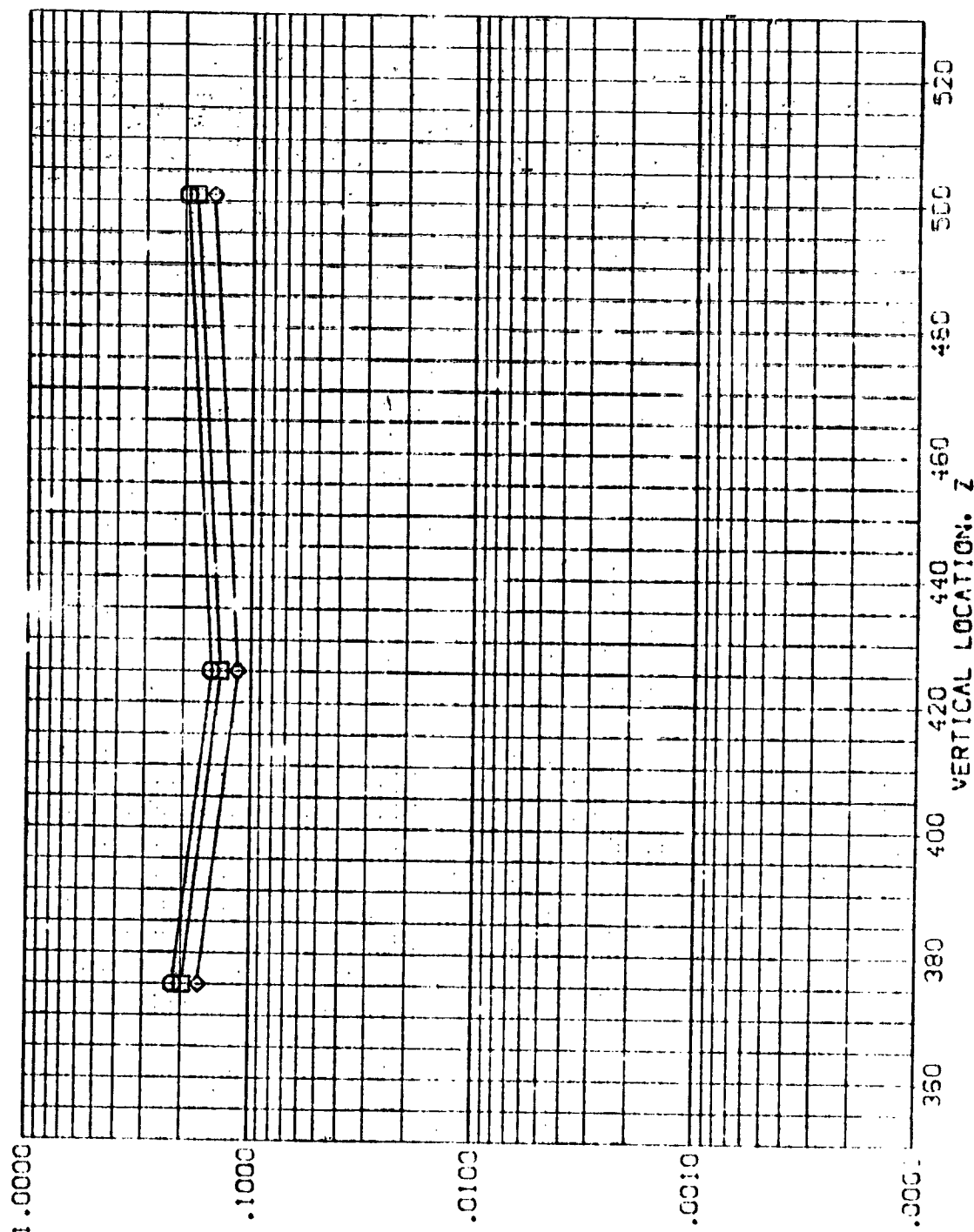


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB09)

PARAMETRIC VALUES  
 -30.000 BETA .000  
 1.000

ALPHA  
 RN/L

SYMBOL  
 HAY/HT X/L MACH  
 .850 .300 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

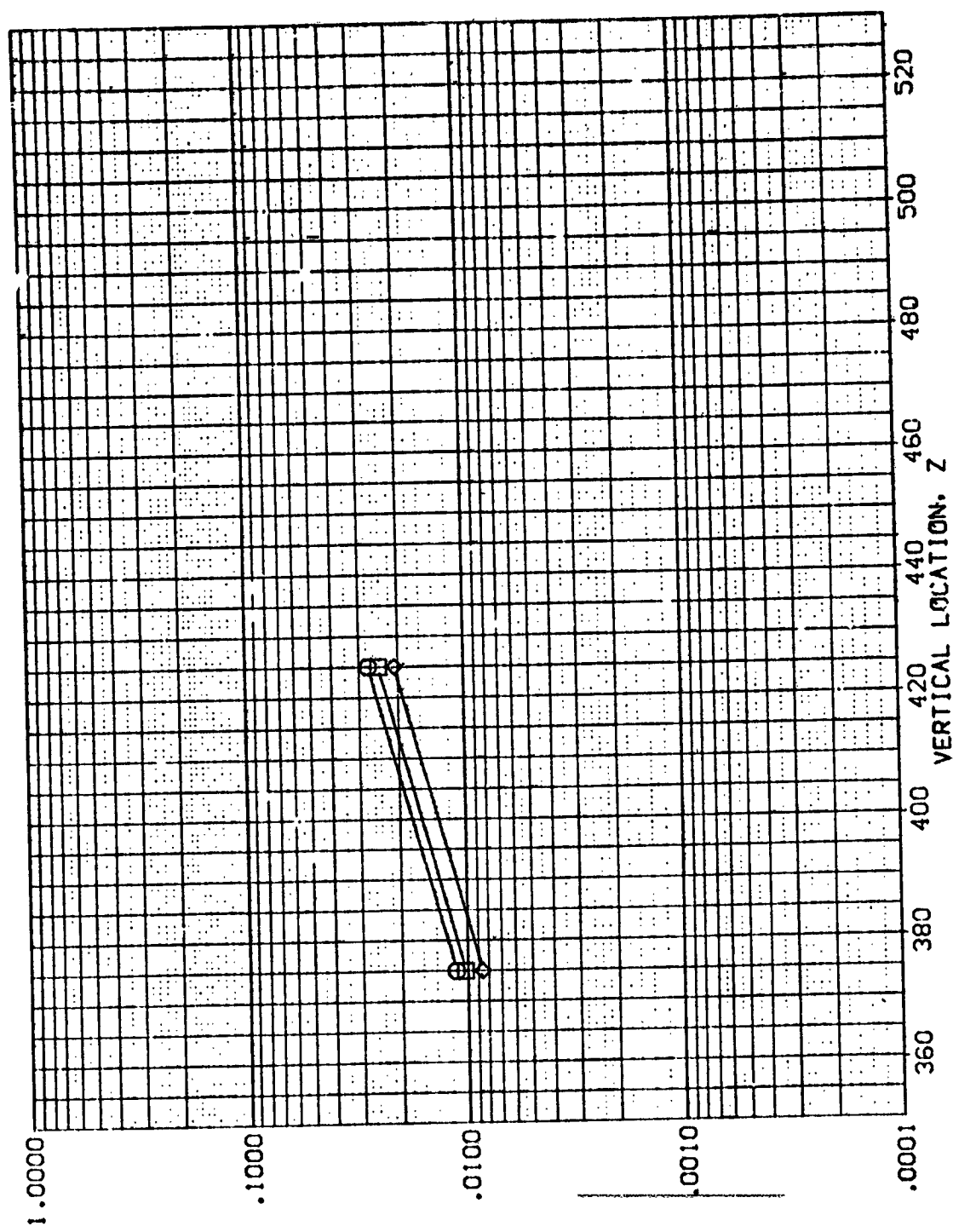


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB09)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	.850	.400	5.220	-30.000	.000
□	.930			1.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

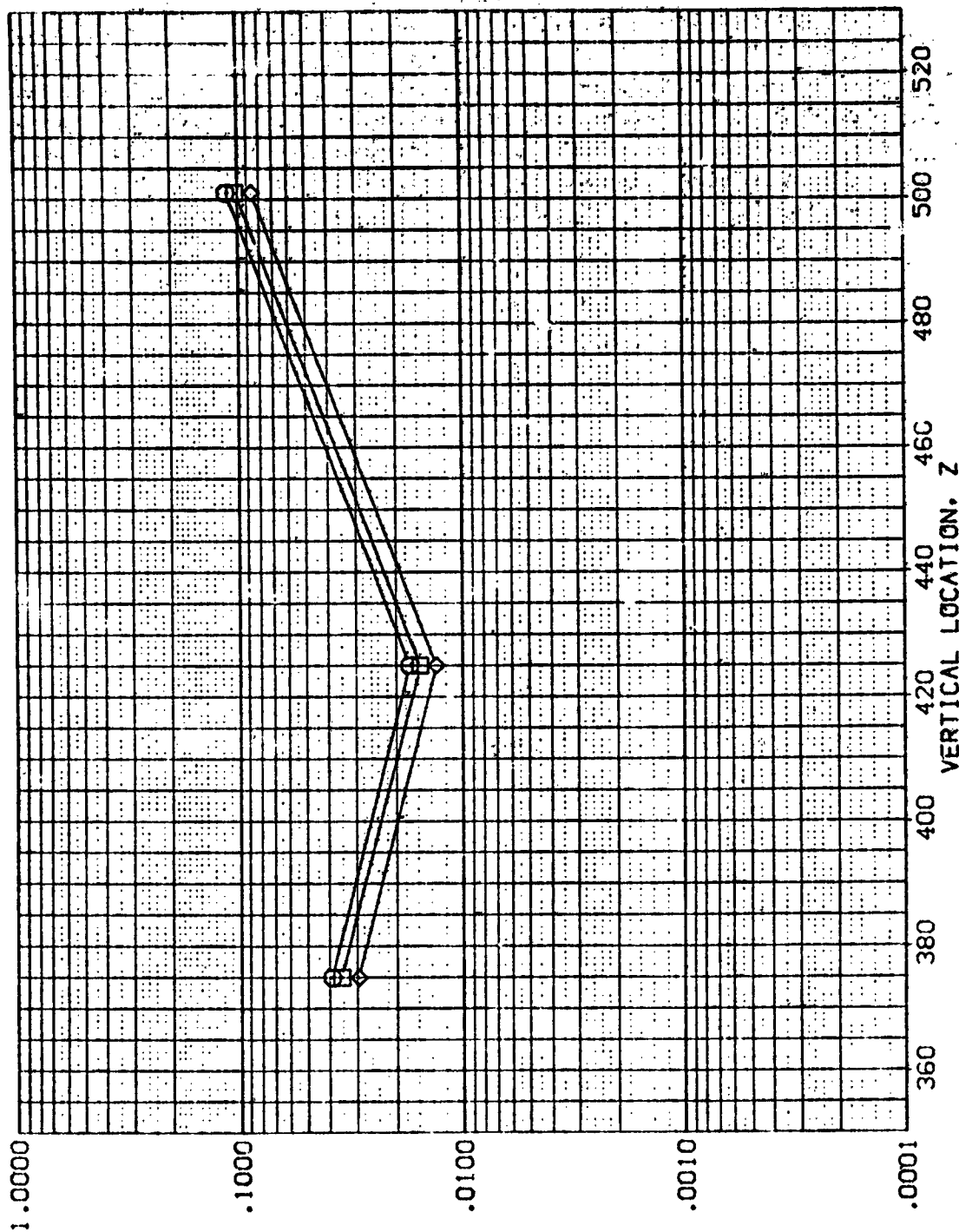


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVBQ9)

SYMBOL  
 ◇ □

HAW/HT .850  
 .900  
 1.000

X/L .500  
 MACH 5.220

PARAMETRIC VALUES  
 ALPHA .000  
 BETA .000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

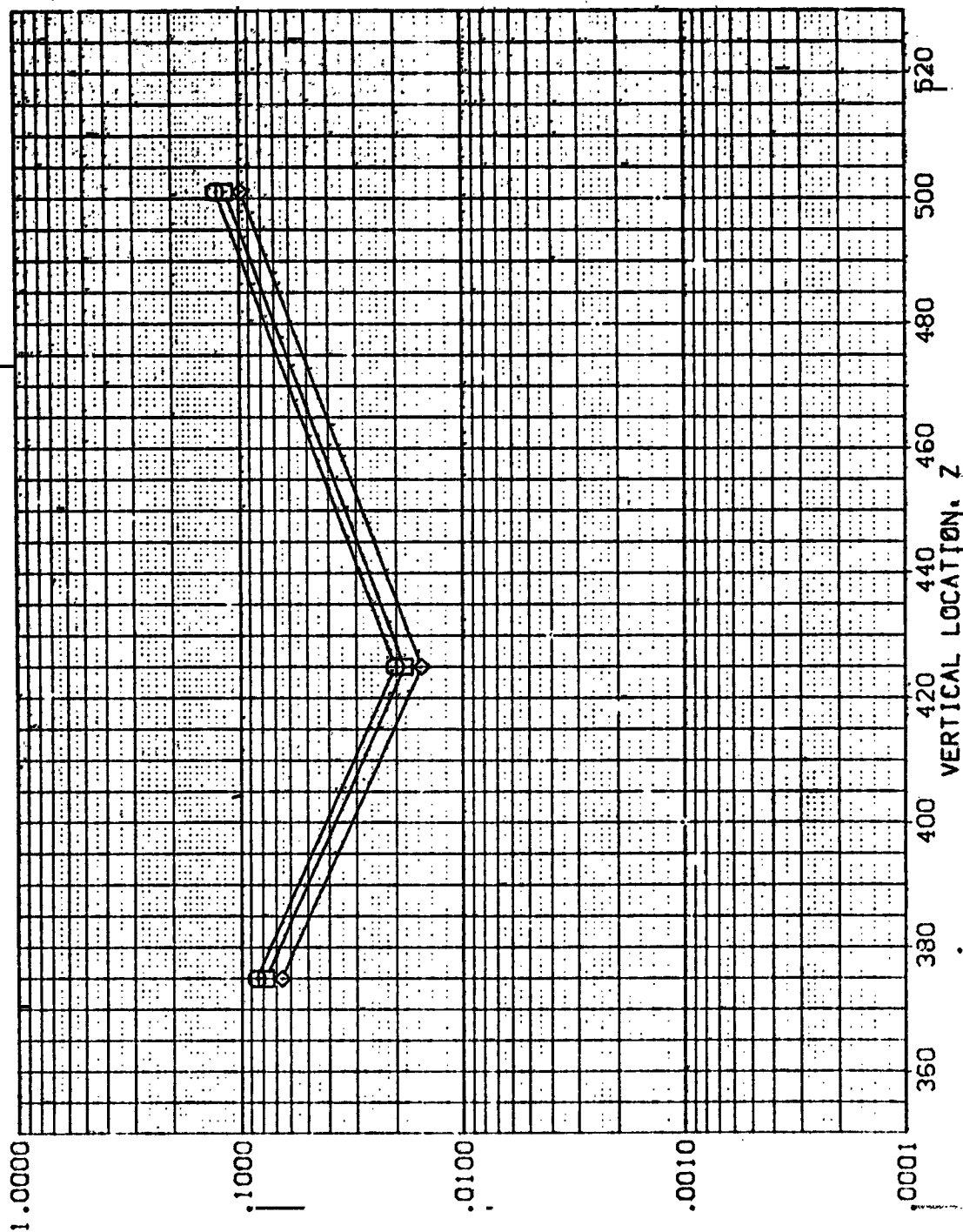


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

SYMBOL  
 □  
 ○  
 ◇

HAW/HT X/L MACH  
 .850 .600 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA -30.000 BETA .000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

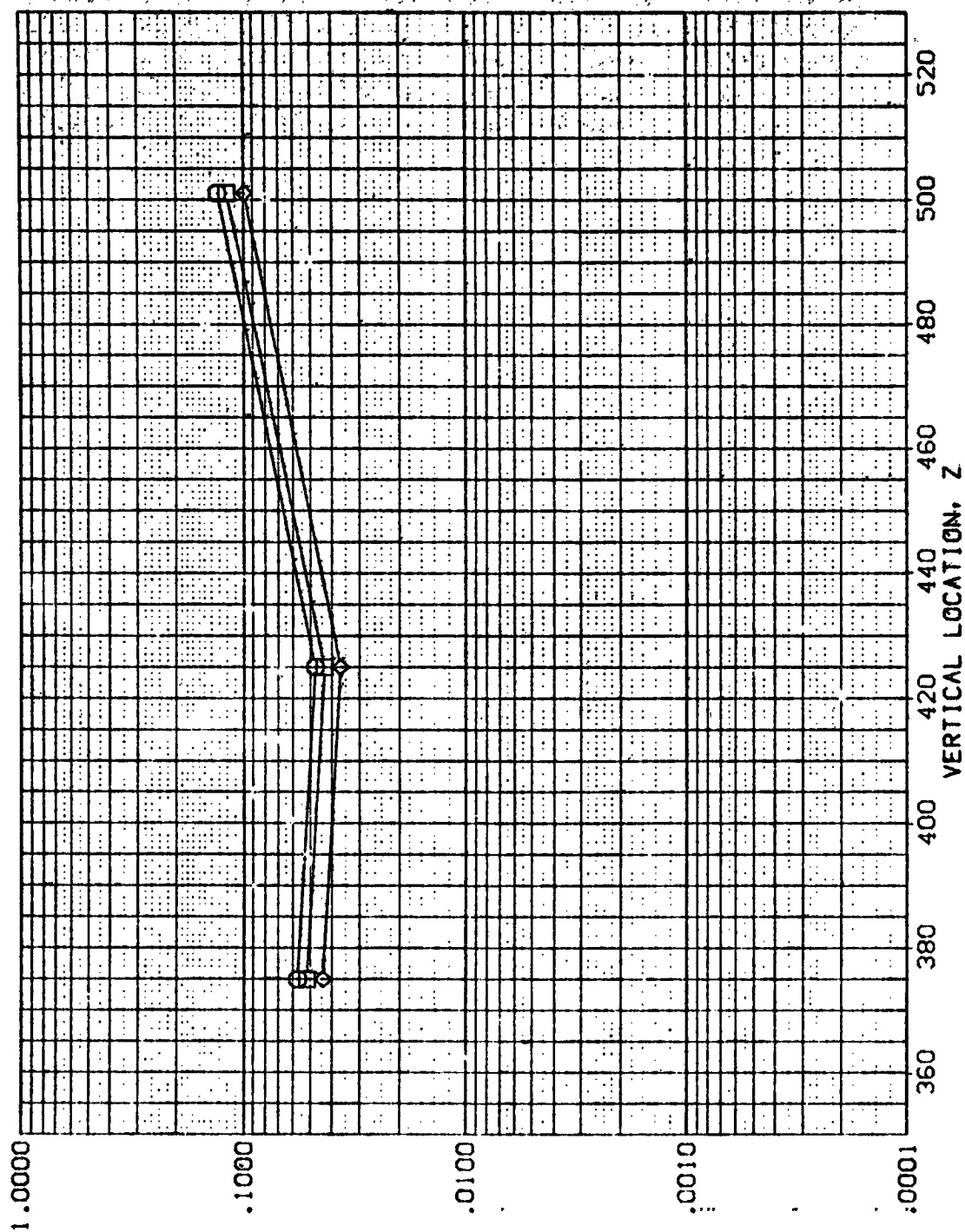


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3,5-195 IH28 01+T1 BODY SIDEWALL

(REVB09)

SYMBOL    NAV/HT    X/L    MACH  
 ◇    .850    .700    5.228  
 □    .900  
   1.000

PARAMETRIC VALUES  
 ALPHA    BETA  
 RN/L    .000  
   1.000

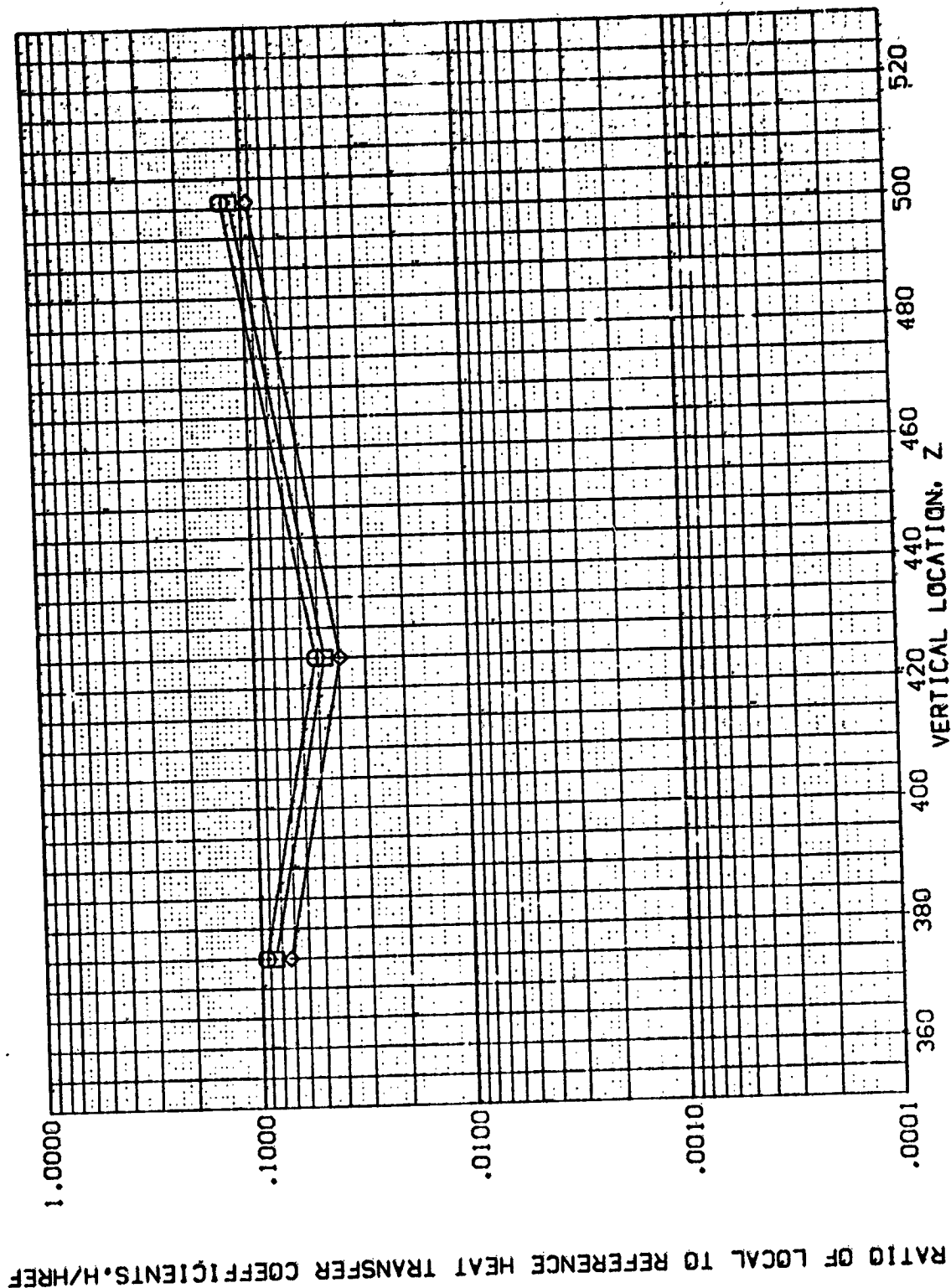


FIG. 11 ORBITER BODY SIDEWALL. ORBITER IN PRESENCE OF THE TANK

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES
◇	.850	.300	5.293	ALPHA
□	.900			RN/L
◇	1.000			BETA
				60.000
				4.000
				.500

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

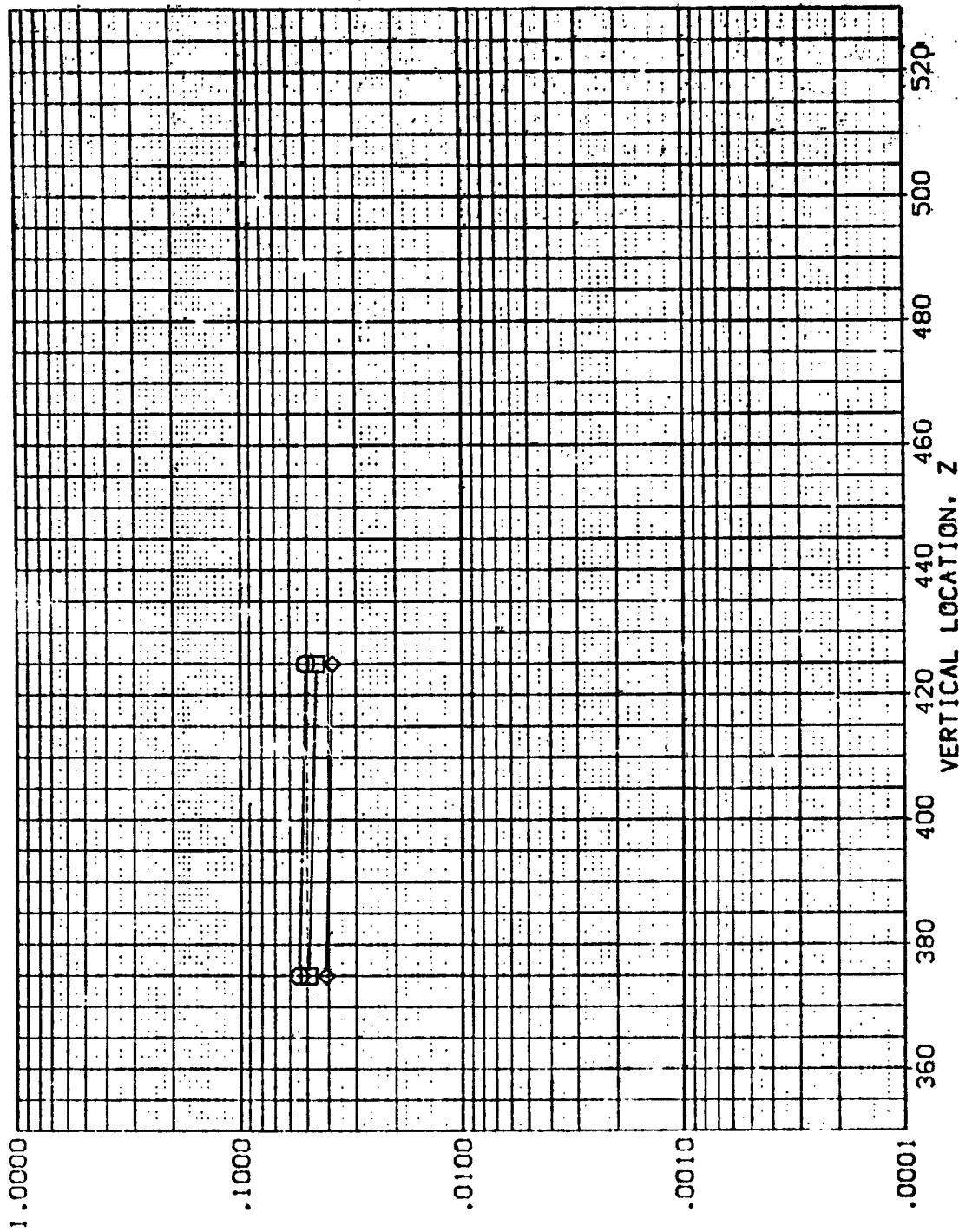


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REV B10)

SYMBOLS

000° I  
006°  
058°  
14/AVH

**MACH 5.299**

x/l .400

PARAMETRIC VALUES	
ALPHA	BETA
60.000	4.000
RM/1	

PARAMETRIC VALUES	
60.000	BETA
4.000	

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

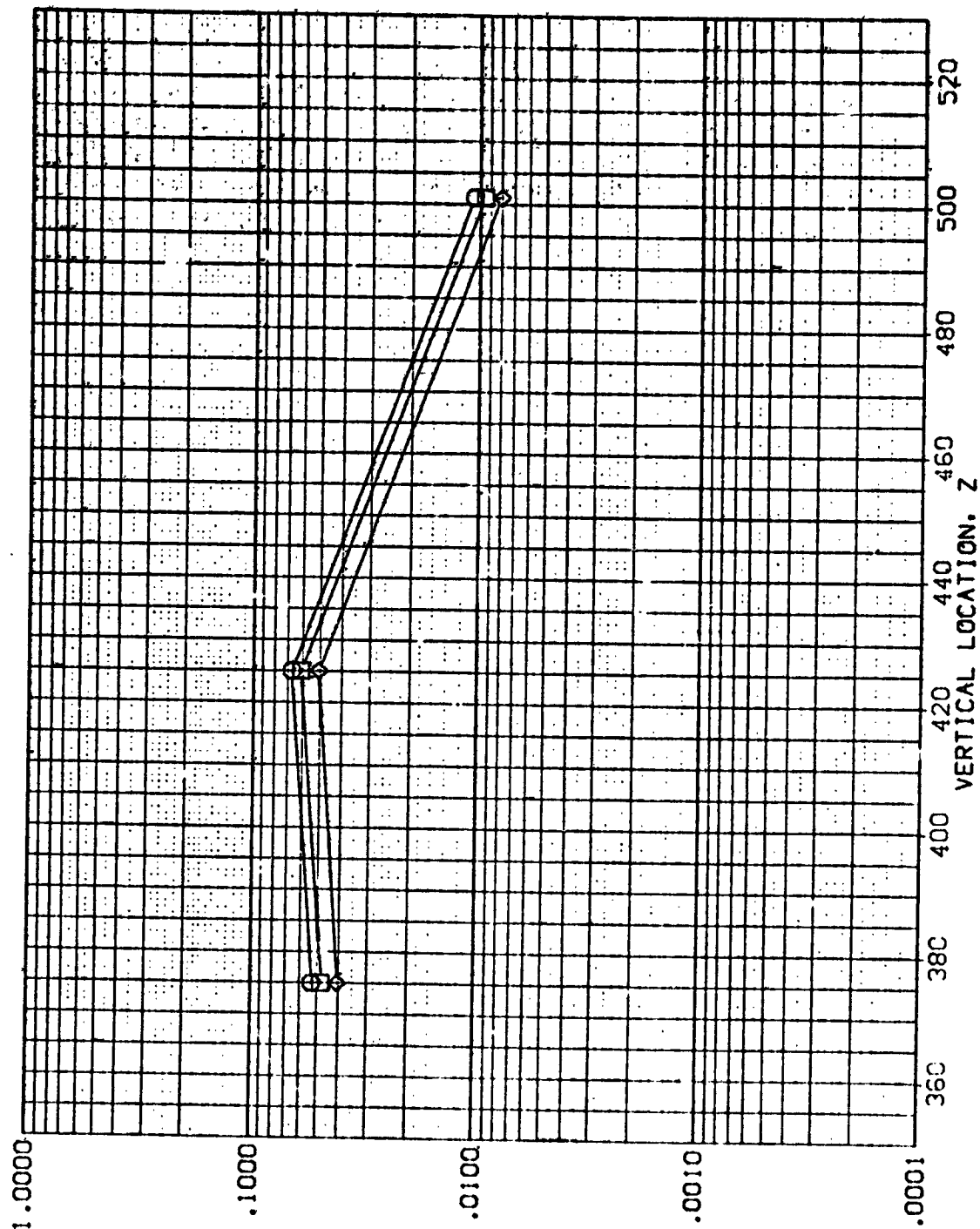


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



# AMES 3.5-195 1-28 01-T1 BODY SIDEWALL

(REVB100)

SYMBOL  
 □  
 ○  
 ◇

HAW/HT  
 .850  
 .300  
 1.000

X/L  
 .500

MACH  
 5.299

PARAMETRIC VALUES

60.000 BET

4.000

ALPHA

PN/L

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

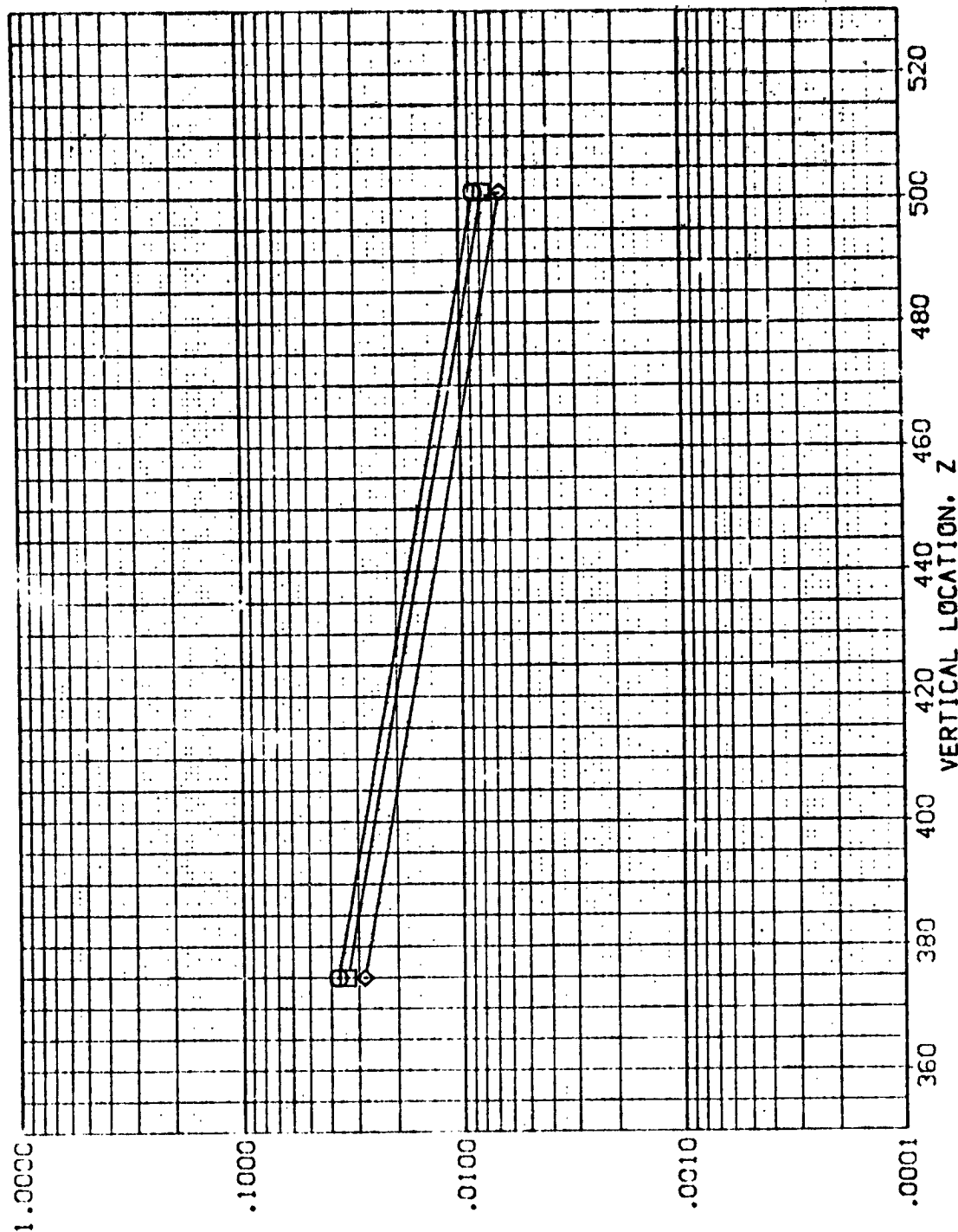


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB10)

PARAMETRIC VALUES  
 ALPHA 60.000  
 BETA 4.000  
 RV/L .000

SYMBOL MACH X/L  
 ◇ .850  
 □ .900  
 ○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $H/H_{REF}$

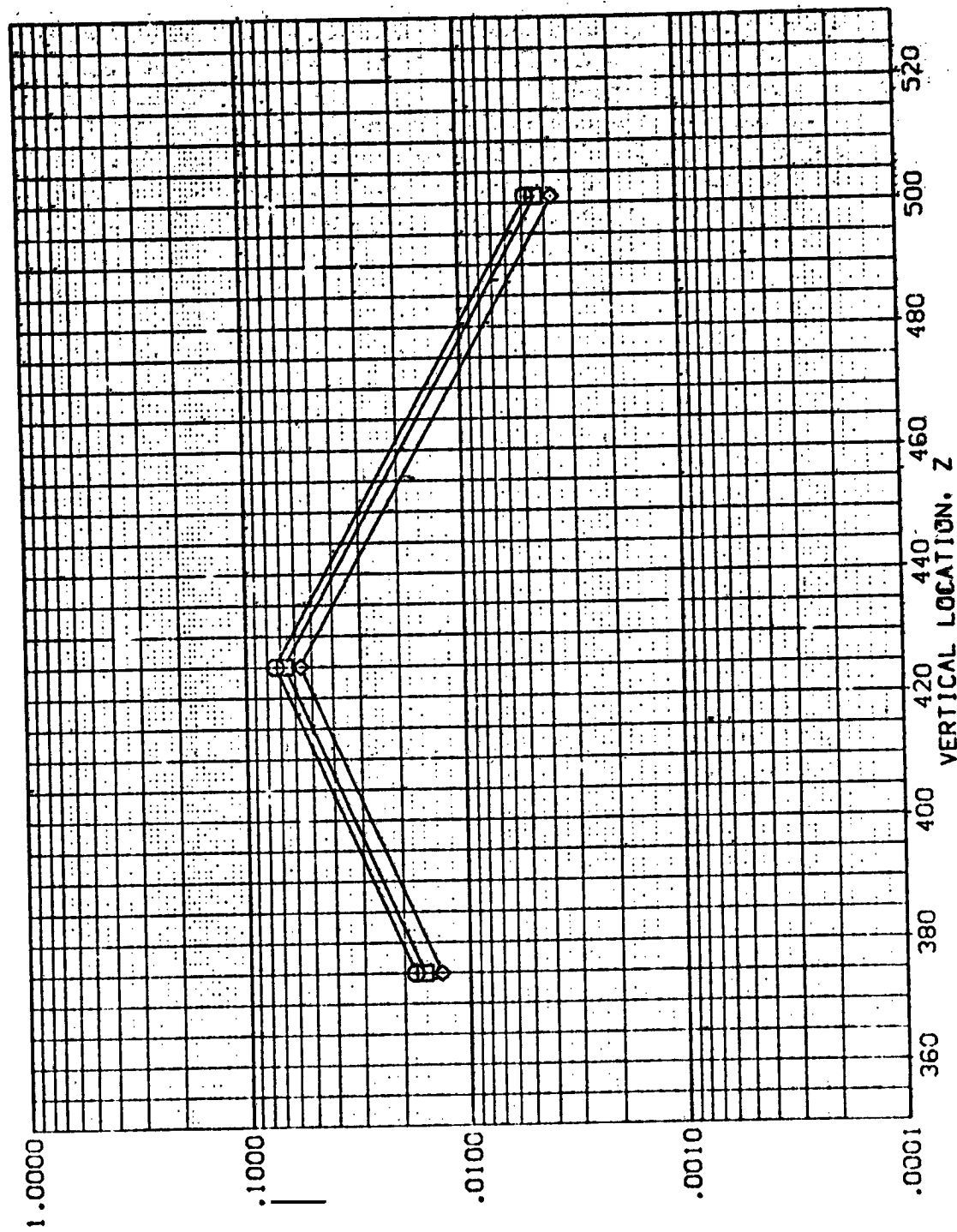


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB10)

SYMBOL  
 □  
 ◇

HAIR/HT .850  
 .900  
 1.000  
 X/L .700  
 MACH 5.299

PARAM. RIC VALUES  
 ALPHA 60.000  
 RN/L 4.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

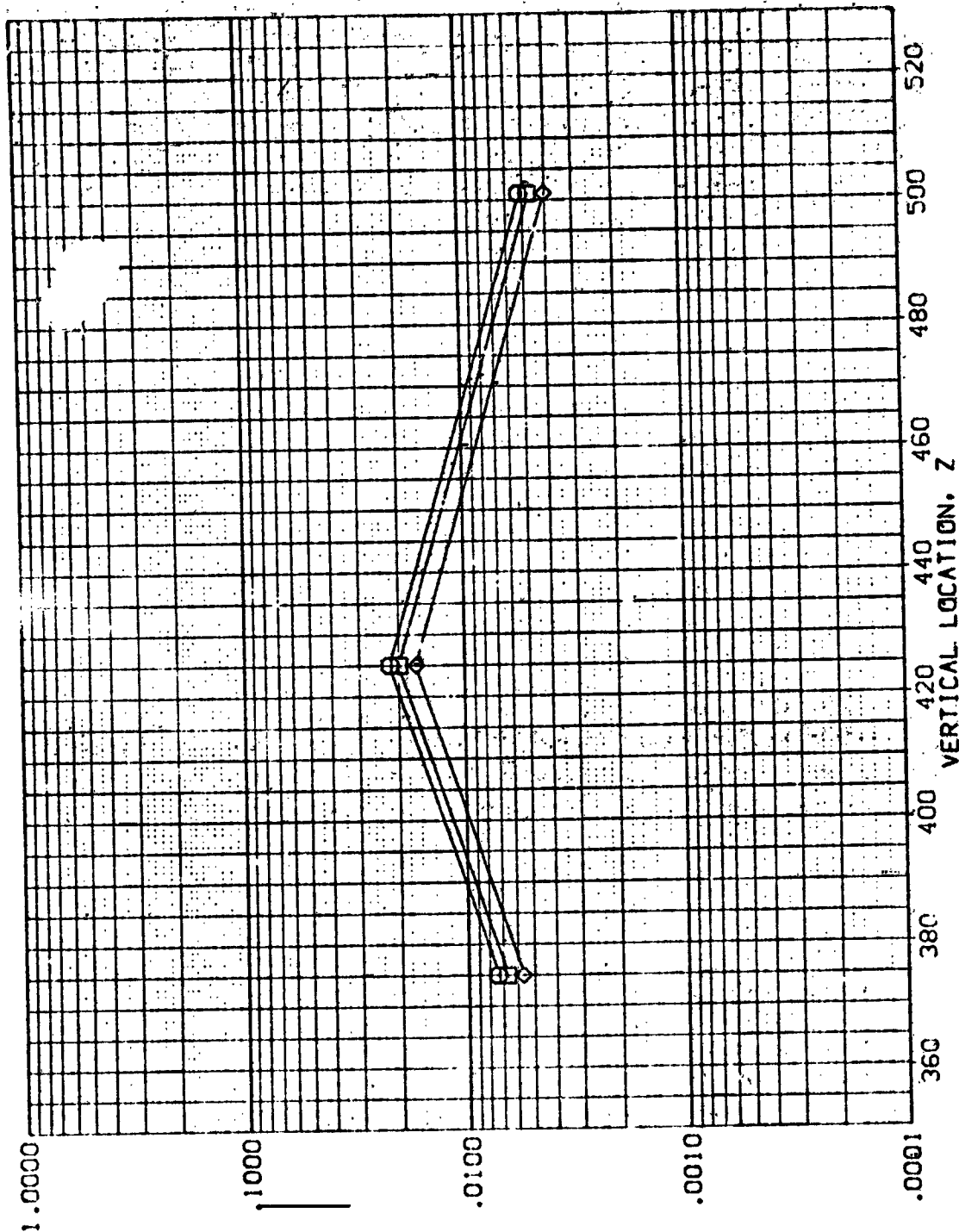


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

(REVB11)

SYMBOL  $\diamond$   $\square$

HAW/HT .850  
.900  
1.000

X/L .300

MACH 5.300

PARAMETRIC VALUES  
ALPHA  $Re/\sqrt{L}$  20.000  
BETA 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

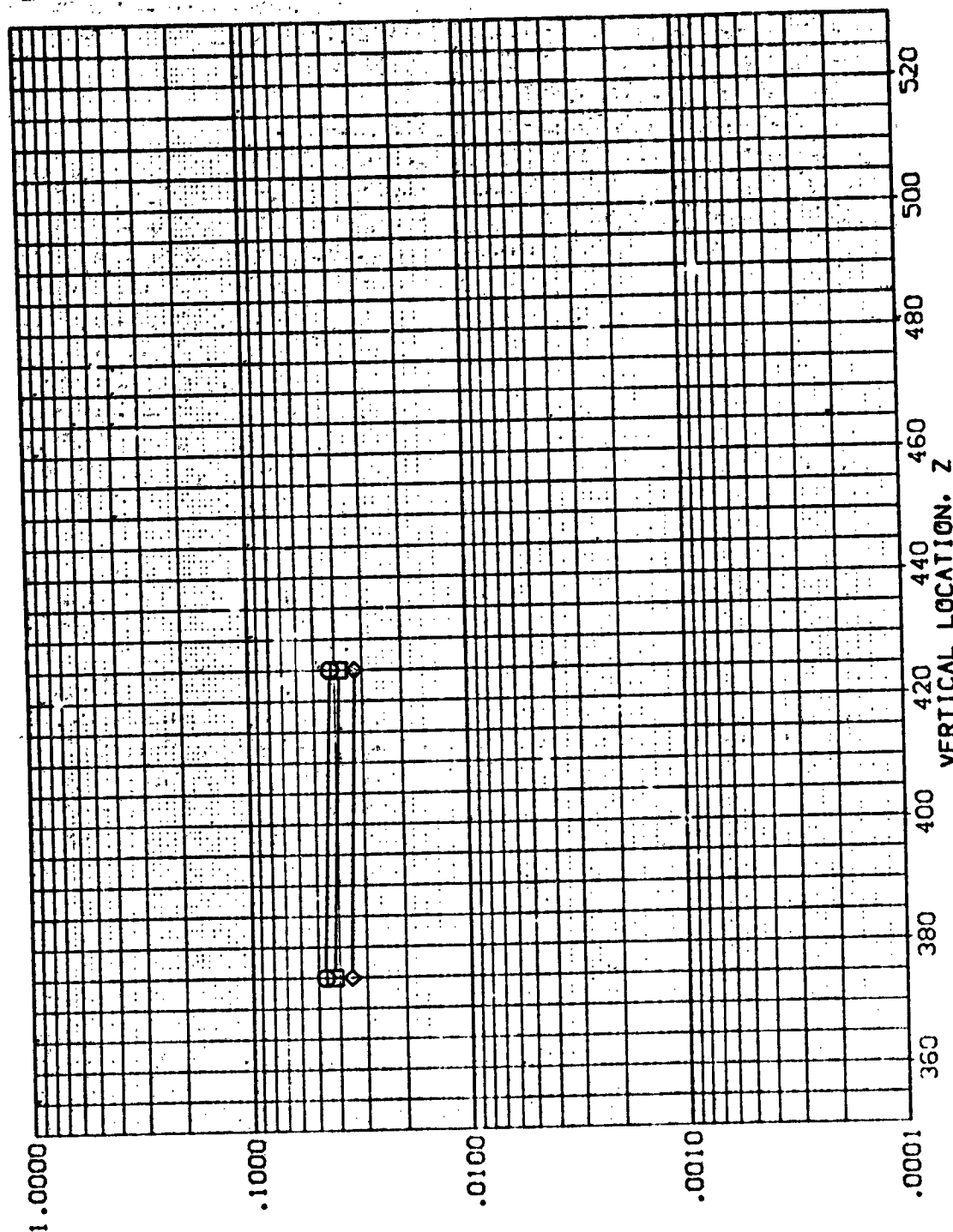


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



# AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB11)

SYMBOL	MAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA
◇	.850	.500	5.300	30.000	.000
□	.900			4.000	
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

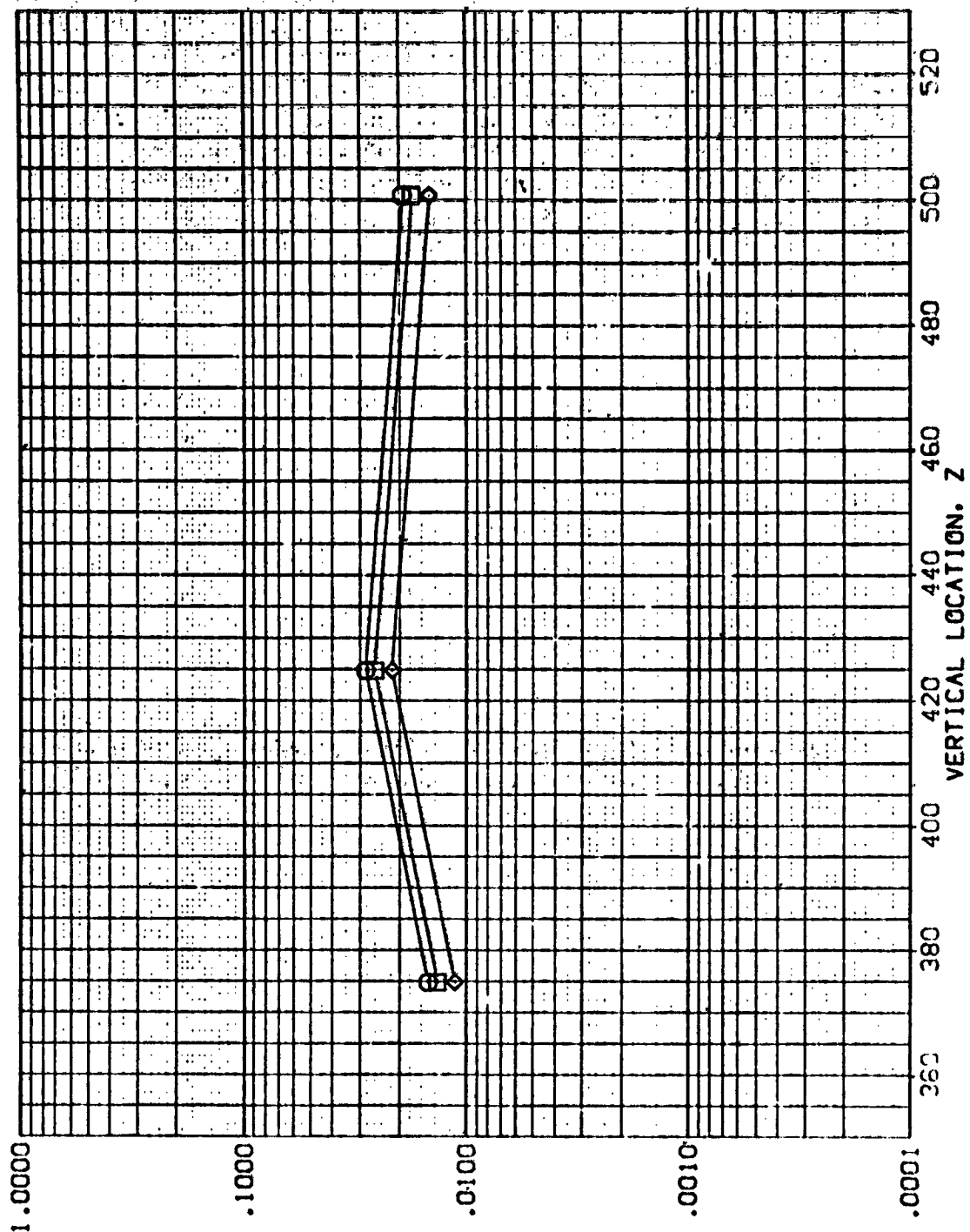


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

# AMES 3.5-195 1428 01+T1 BODY SIDEWALL

(REV 1)

SYMBOL

MAW/HT  
.850  
.900  
1.000

X/L  
.600

MACH  
5.300

PARAMETRIC VALUES

ALPHA  
30.000

BETA  
4.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

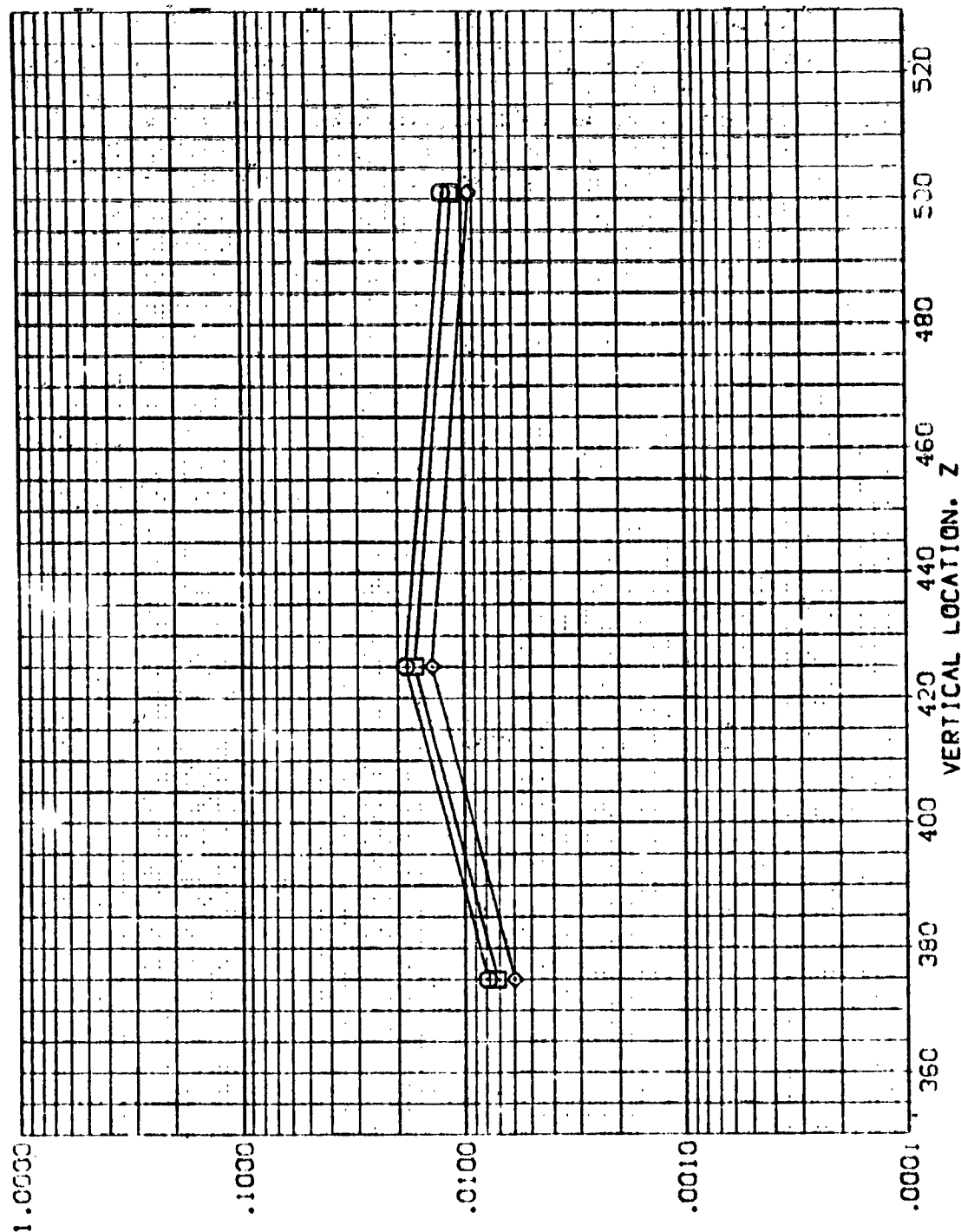


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB11)

PARAMETRIC VALUES  
 ALPHA 30.000 BETA .000  
 RN/L 4.000

SYMBOL HAV/HT X/L MACH  
 .850  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

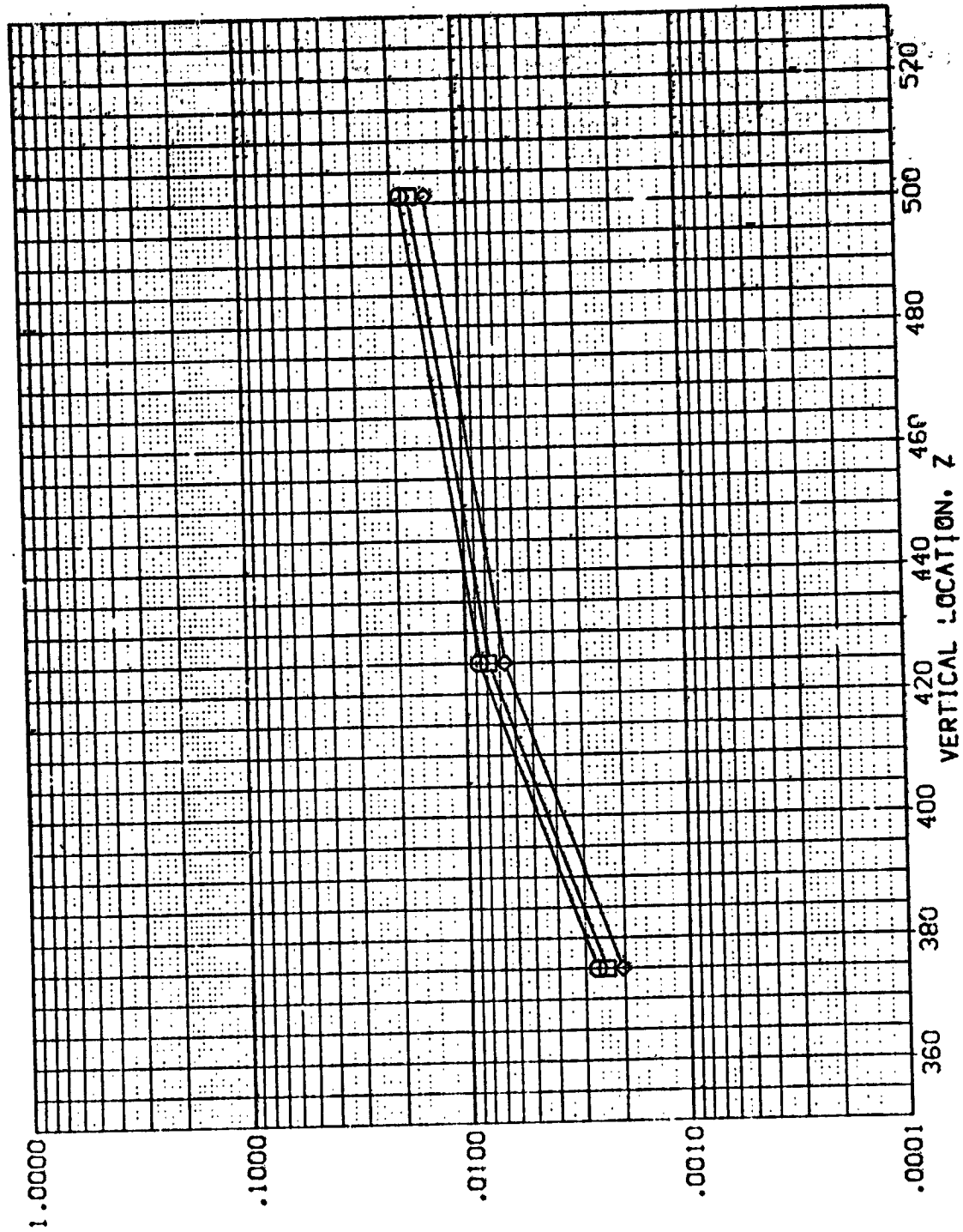


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



(REVB12)

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

SYMBOL  $\diamond$   $\square$   $\circ$

HAY/HT .850  
X/L .300  
MACH 5.220  
1.000

PIRA C VALUES  
ALPHA 30.6  
RN/L 1.000  
BETA -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

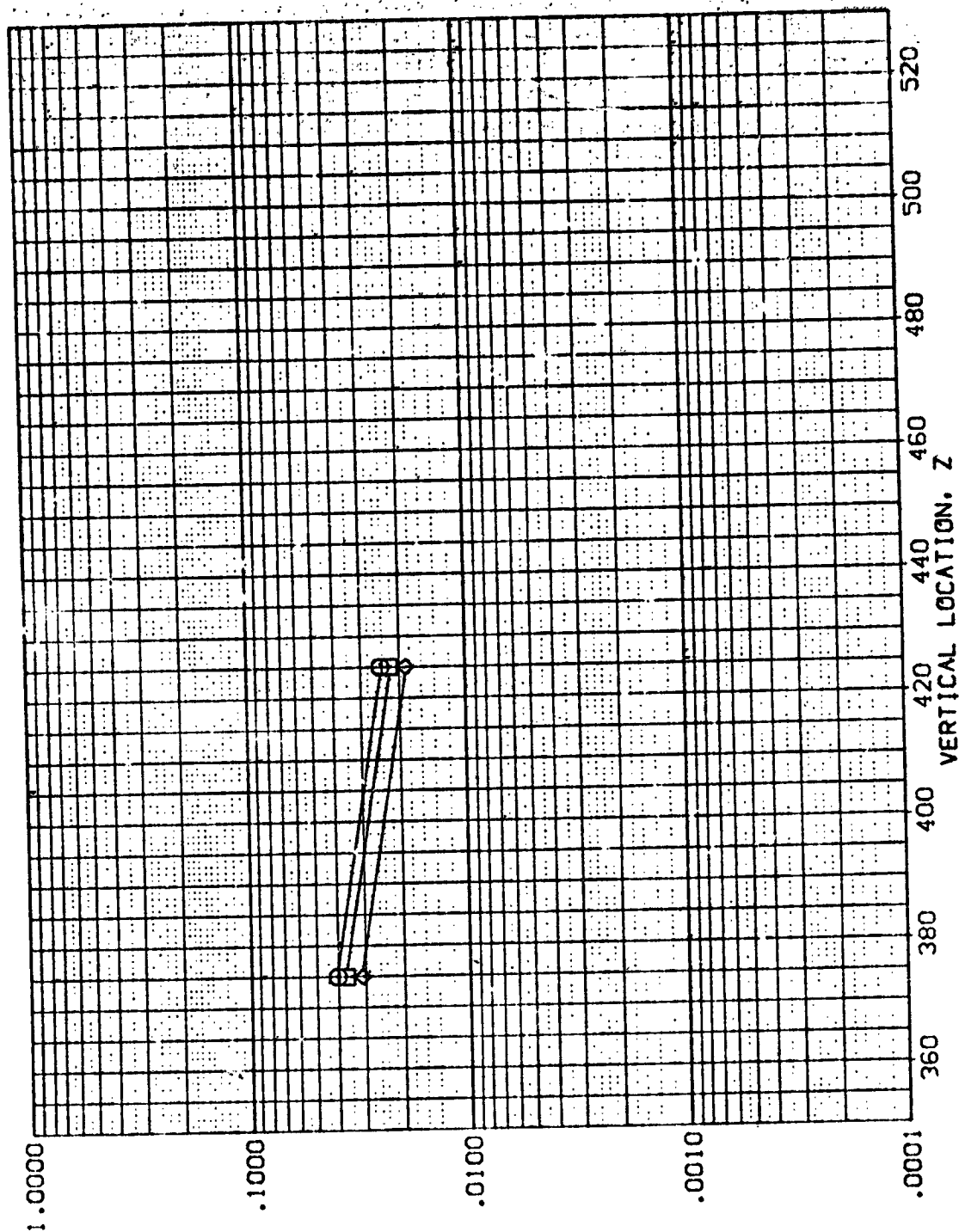


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB12)

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 1.000  
 RV/L -5.000

SYMBOL  
 H/H<sub>REF</sub> .850  
 X/L .400  
 MACH 5.220  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/H<sub>REF</sub>

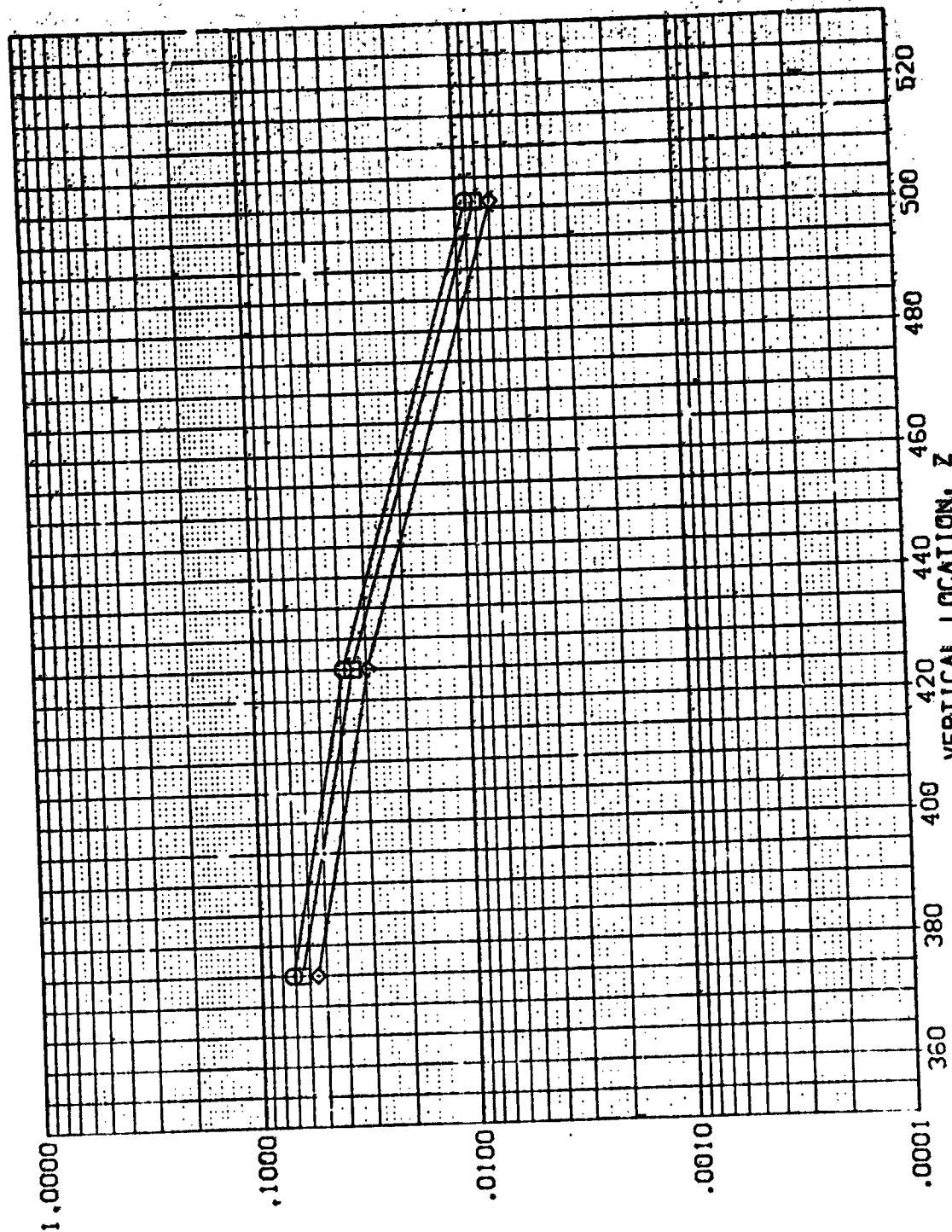


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

(REVB12)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL  
□  
◇  
1.000

HAY/HT  
.850  
.900  
1.000

X/L  
.500

MACH  
5.220

PARAMETER C VALUES  
70.000  
1.000

ALPHA  
RN/L

BETA

-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

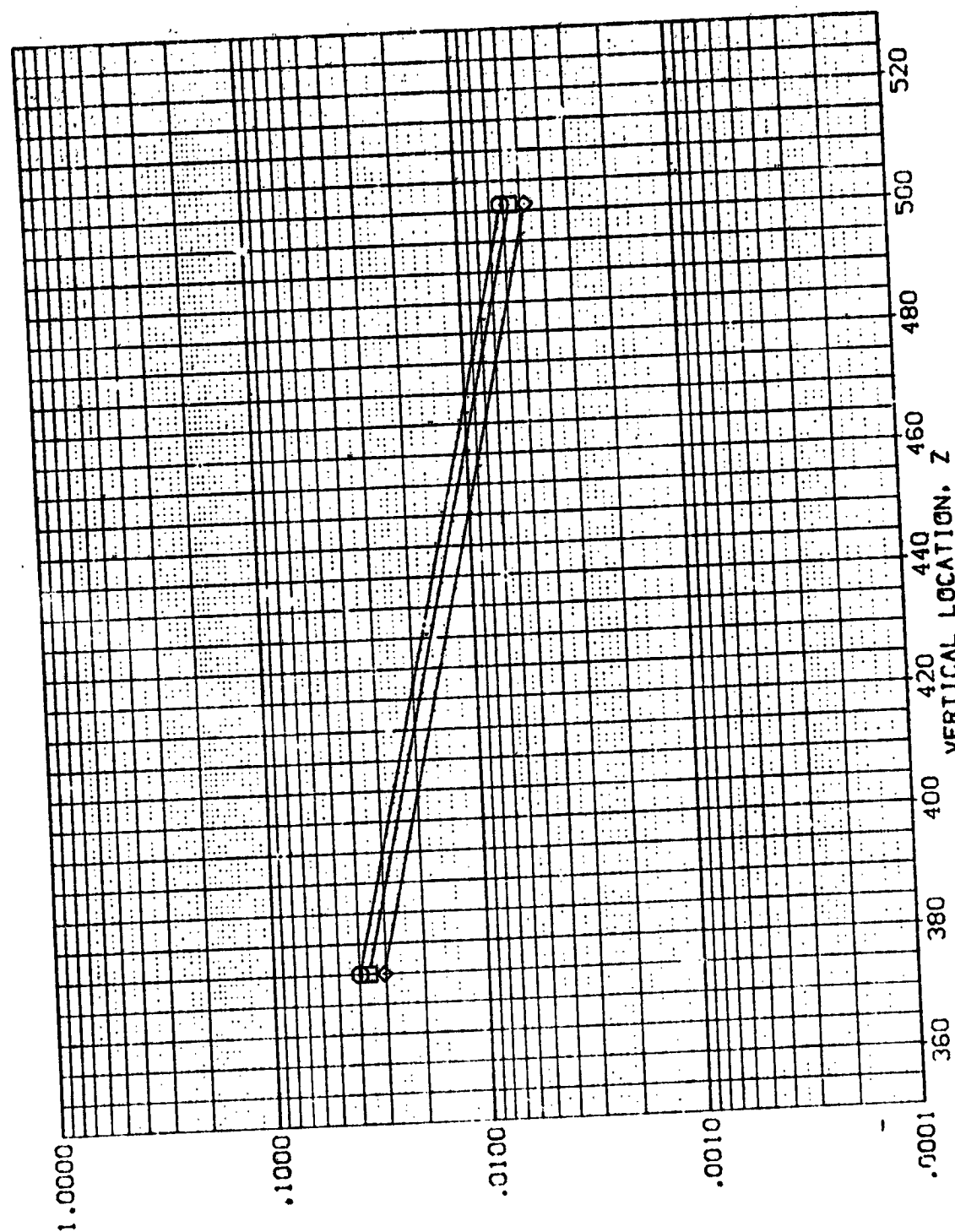


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(REVB12)

SYMBOL	MAV/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA	BETA
◇	.850	.600	5.220	30.000	1.000
◇	.900				
◇	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

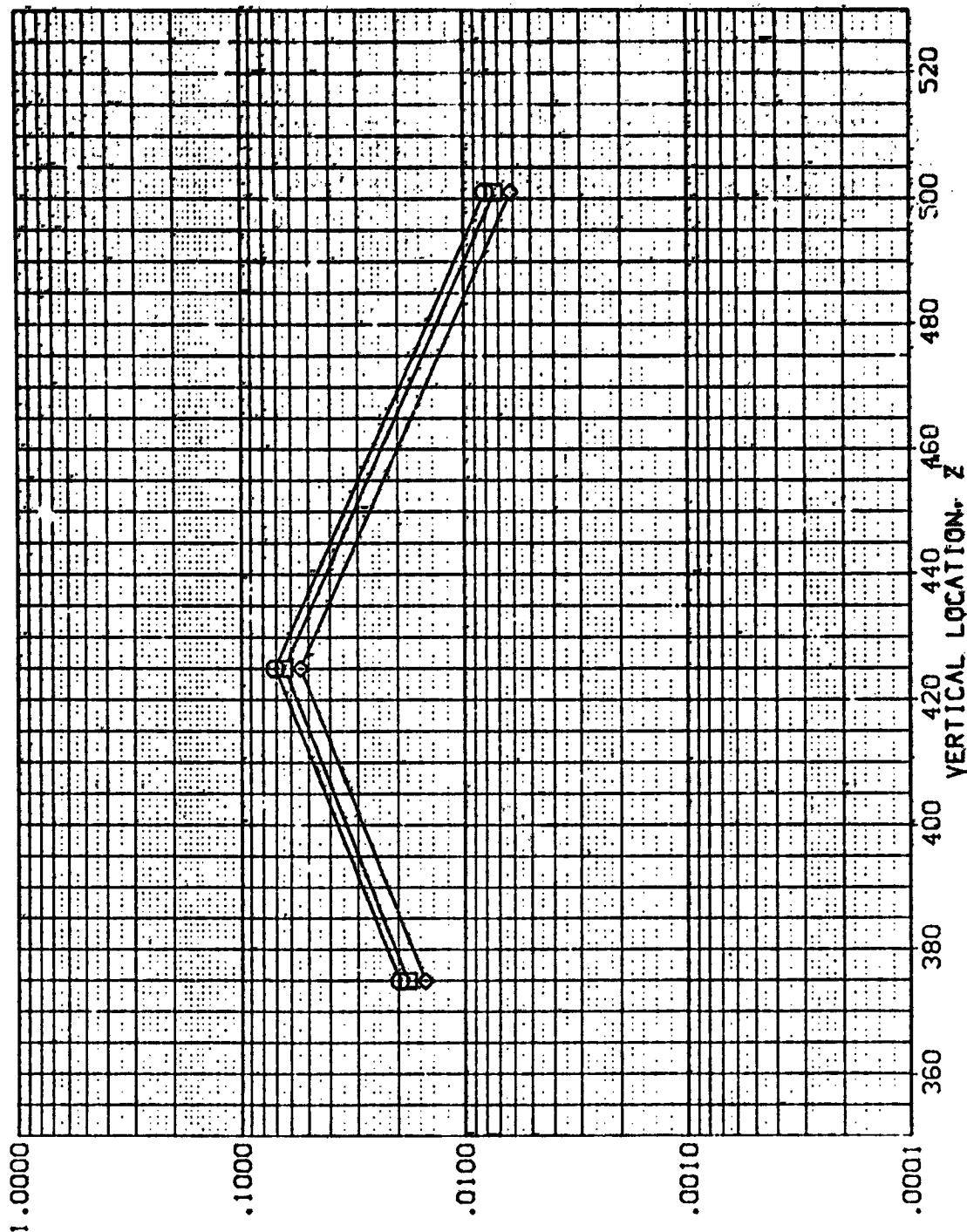


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

SYMBOL	HA/WHT	X/L	MACH	PAP	RIC VALUES
□	.850	.700	5.220	30.00	BETA
◇	.900			1.000	-5.000
	1.000				

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

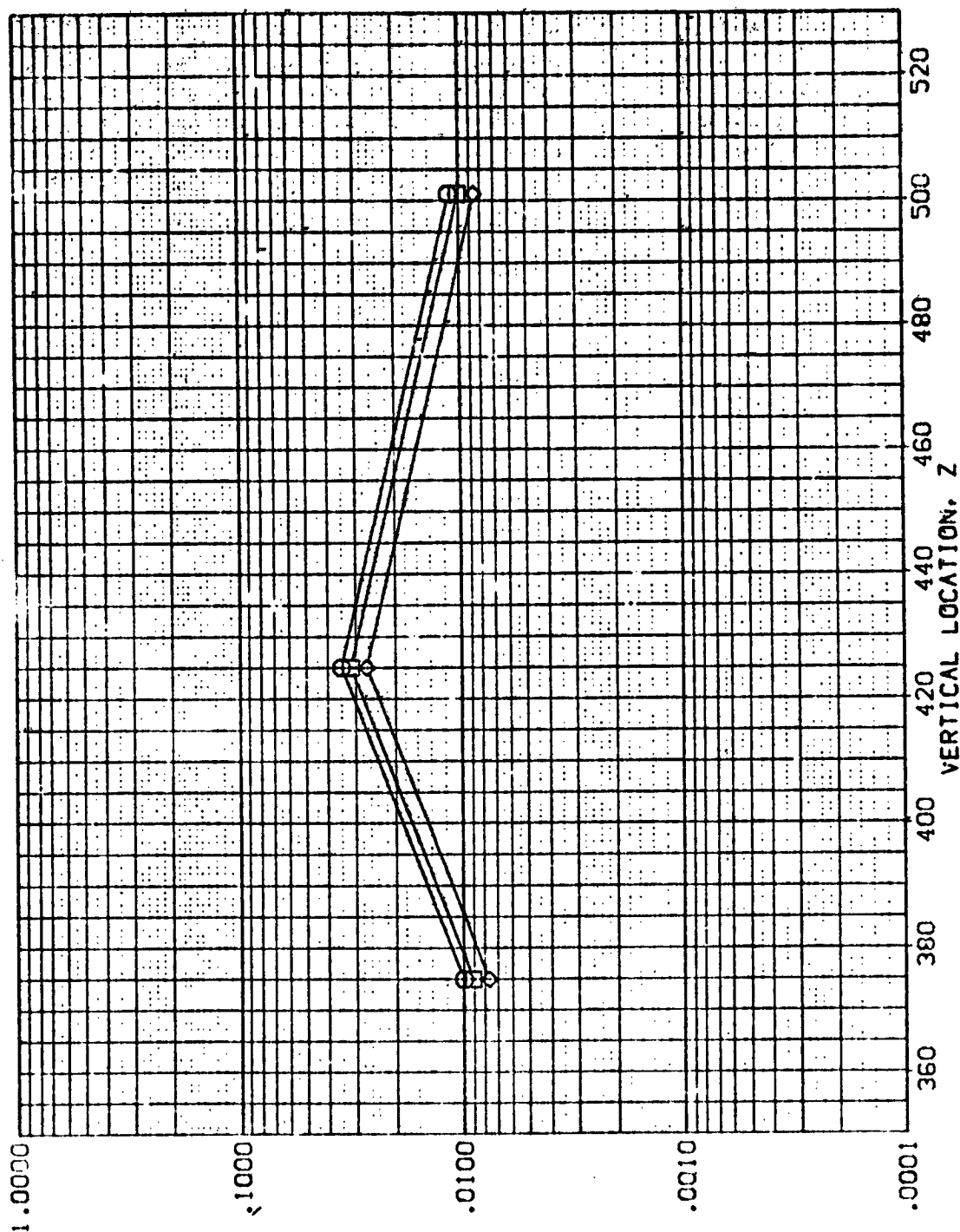


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

DATA SET SYMBOL  
(REV801)  
(REV802)  
(REV803)  
(REV804)  
(REV805)

CONFIGURATION DESCRIPTION  
AMES 3.5-195 1H28 01+T1 BODY SIDEWALL  
AMES 3.5-195 1H28 01+T1 BODY SIDEWALL  
AMES 3.5-195 1H28 01+T1 BODY SIDEWALL  
AMES 3.5-195 1H28 01+T1 BODY SIDEWALL  
AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

ALPHA  
.000  
30.000  
60.000  
90.000  
120.000

BETA  
.000  
.000  
.000  
.000  
.000

RV/L  
1.000  
1.000  
1.000  
1.000  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

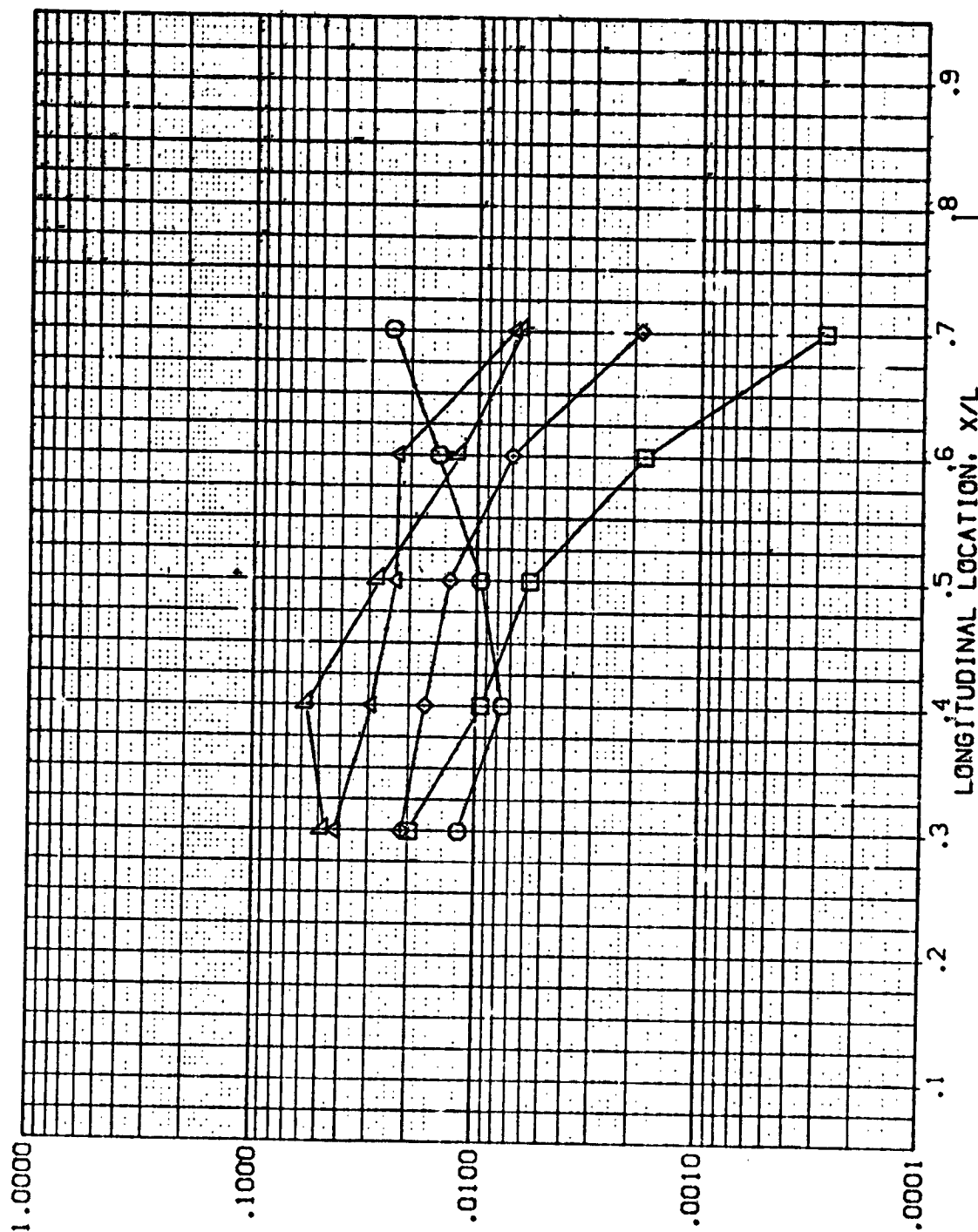


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.000 HAW/HT = .900 Z = 375.000

DATA SET SYMBOL CONFIGURATION DESCRIPTION

(REV8C1)	AMES 3.5-195	1428	01+11	BODY	SIDEWALL
(REV8C2)	AMES 3.5-195	1428	01+11	BODY	SIDEWALL
(REV8C3)	AMES 3.5-195	1428	01+11	BODY	SIDEWALL
(REV8C4)	AMES 3.5-195	1428	01+11	BODY	SIDEWALL
(REV8C5)	AMES 3.5-195	1428	01+11	BODY	SIDEWALL

ALPHA BETA RN/L

.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

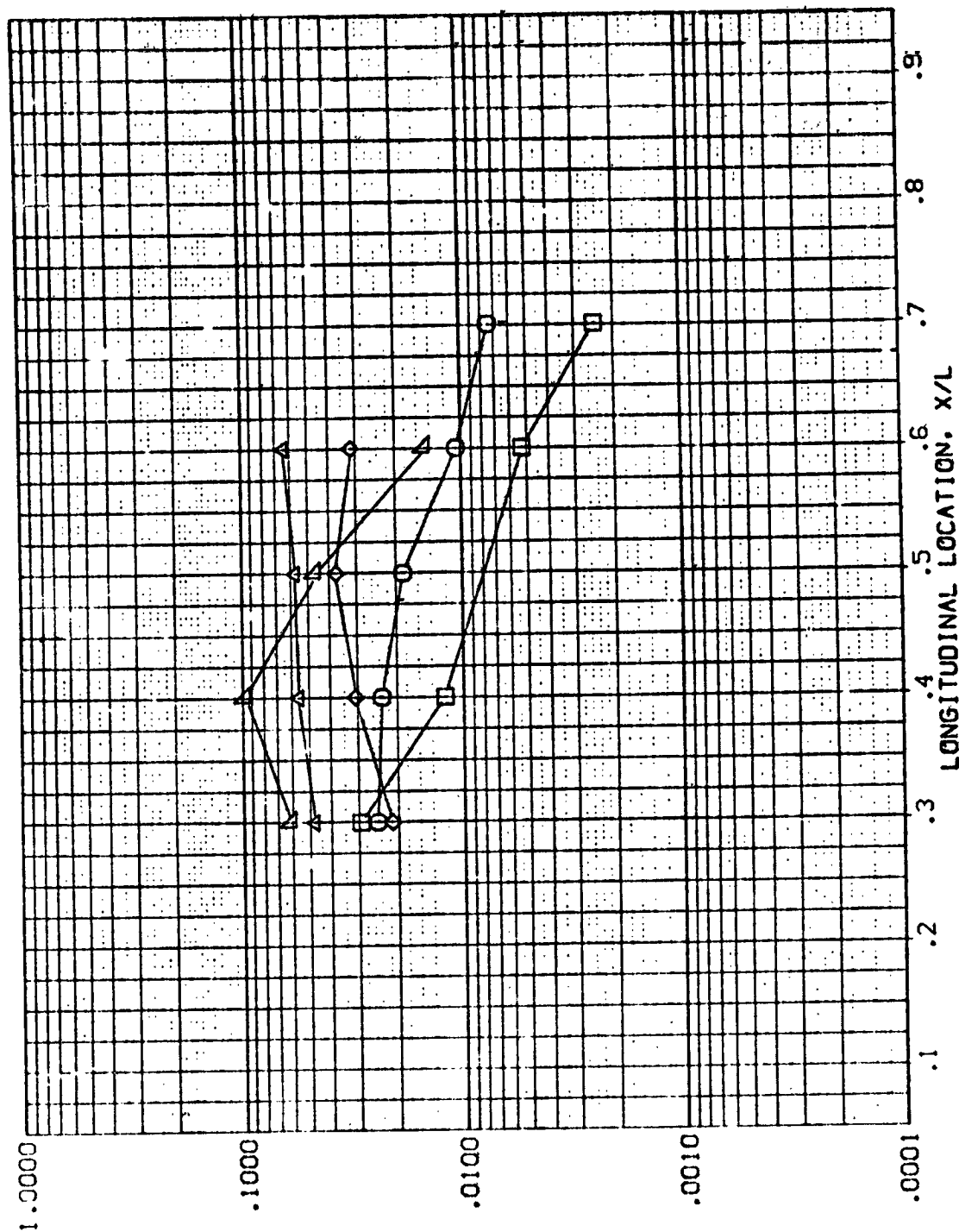


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 4.25 000

ALPHA	BETA	RM/L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(REV801)	AMES 3.5-195 (H28 01+11) BODY SIDEWALL
(REV802)	AMES 3.5-195 (H28 01+11) BODY SIDEWALL
(REV803)	AMES 3.5-195 (H28 01+11) BODY SIDEWALL
(REV804)	AMES 3.5-195 (H28 01+11) BODY SIDEWALL
(REV805)	AMES 3.5-195 (H28 01+11) BODY SIDEWALL

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

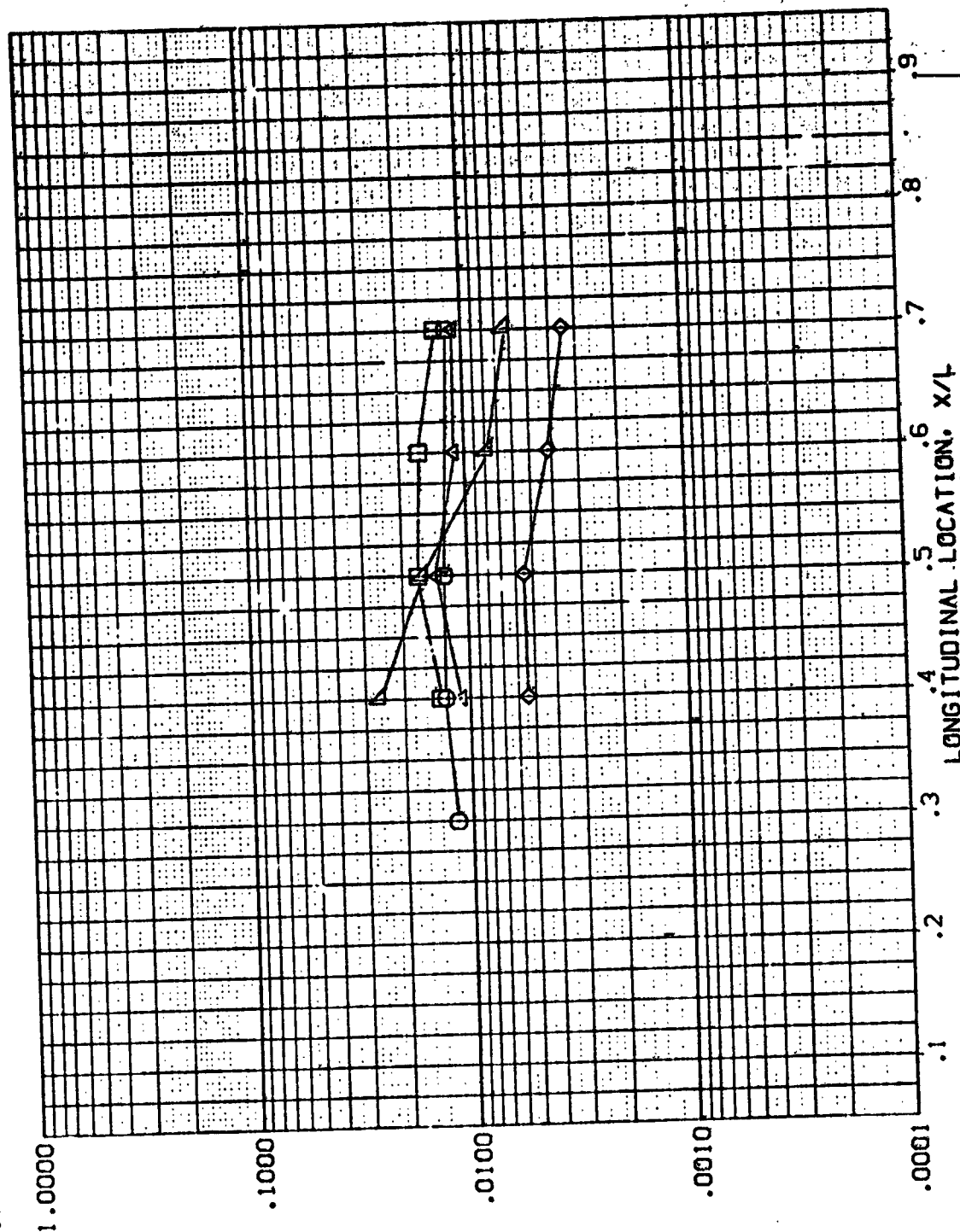


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 501.000



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(REV801) AMES 3.5-195 IH28 01-T1 BODY SIDEWALL  
 (REV802) AMES 3.5-195 IH28 01-T1 BODY SIDEWALL  
 (REV803) AMES 3.5-195 IH28 01-T1 BODY SIDEWALL  
 (REV804) AMES 3.5-195 IH28 01-T1 BODY SIDEWALL  
 (REV805) AMES 3.5-195 IH28 01-T1 BODY SIDEWALL

ALPHA BETA RN/L  
 .000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

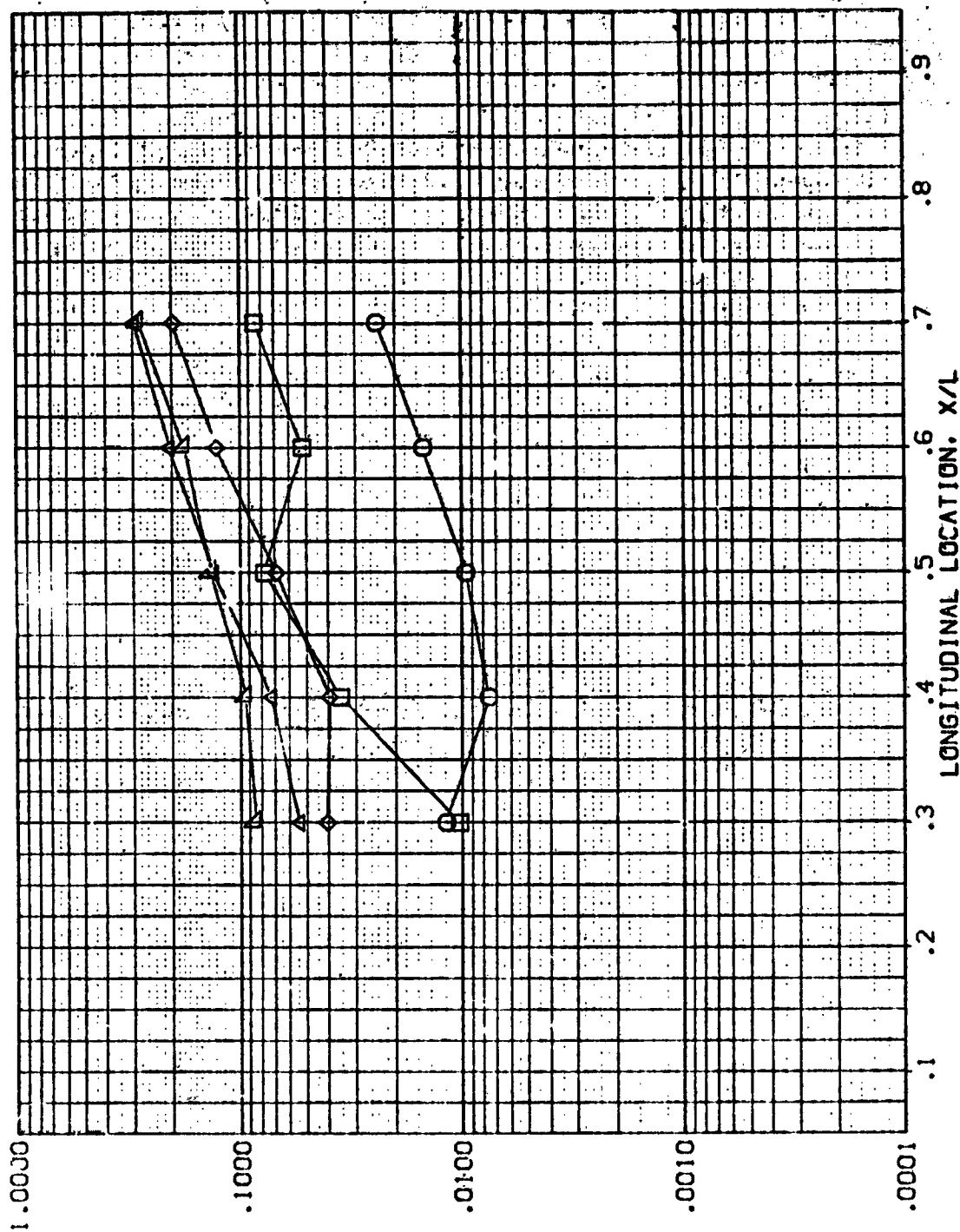


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 375.000

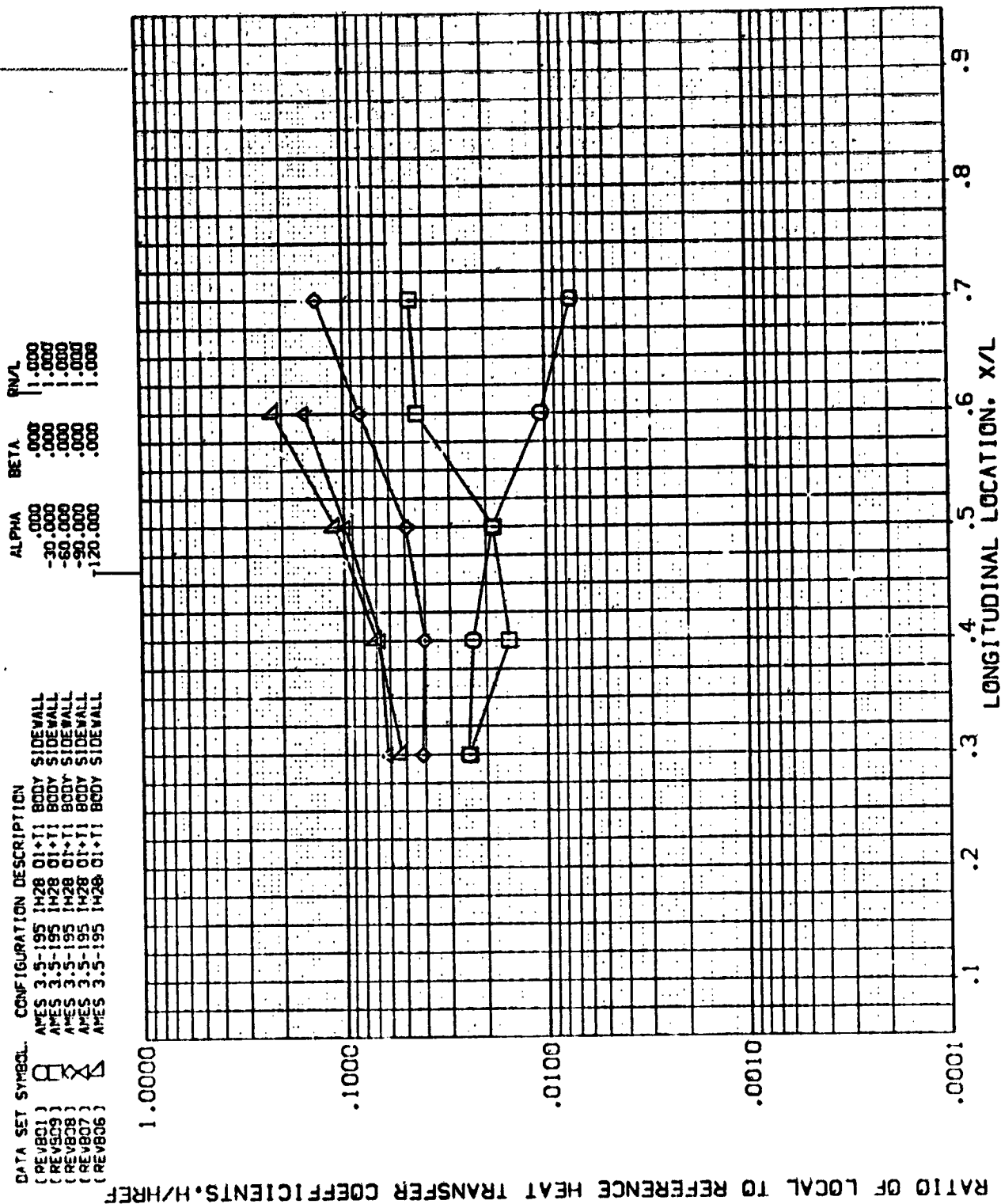


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 425.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

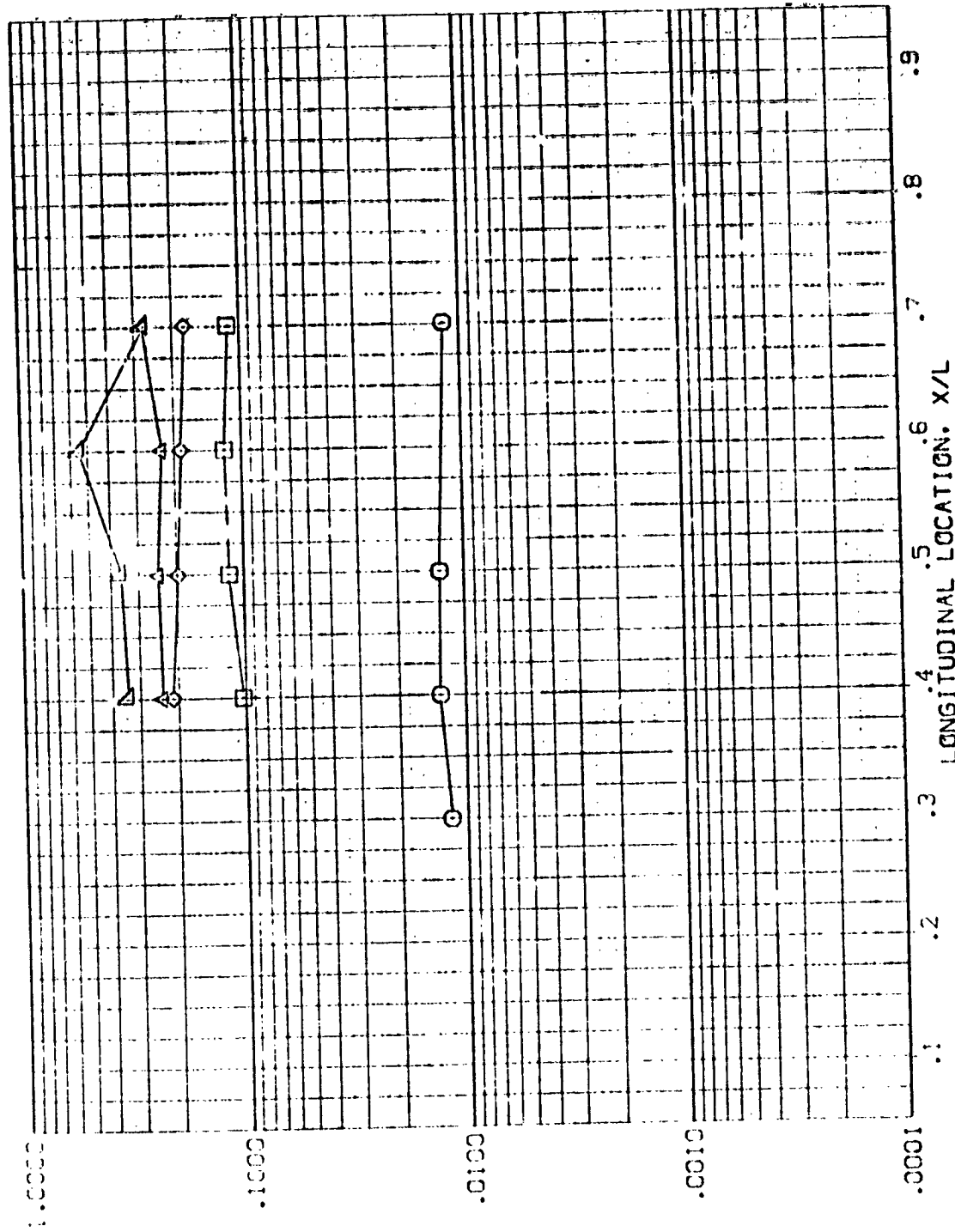


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300  $h_{ref}/h_{ref} = .900$  Z = 501.000

PAGE 630

REPRODUCIBILITY OF TEST  
ORIGINAL PAGE IS POOR

DATA SET SYMBOL:  $\Sigma$  CONFIGURATION DESCRIPTION: ALPHA BETA PN/L

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	PN/L
CEB020	AVS 3.5-185 1428 01+11 BODY SIDEWALL	30.000	.000	1.000
CEB010	AVS 3.5-185 1428 01+11 BODY SIDEWALL	30.000	.000	4.000
CEB030	AVS 3.5-185 1428 01+11 BODY SIDEWALL	60.000	.000	1.000
CEB010	AVS 3.5-185 1428 01+11 BODY SIDEWALL	60.000	.000	4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

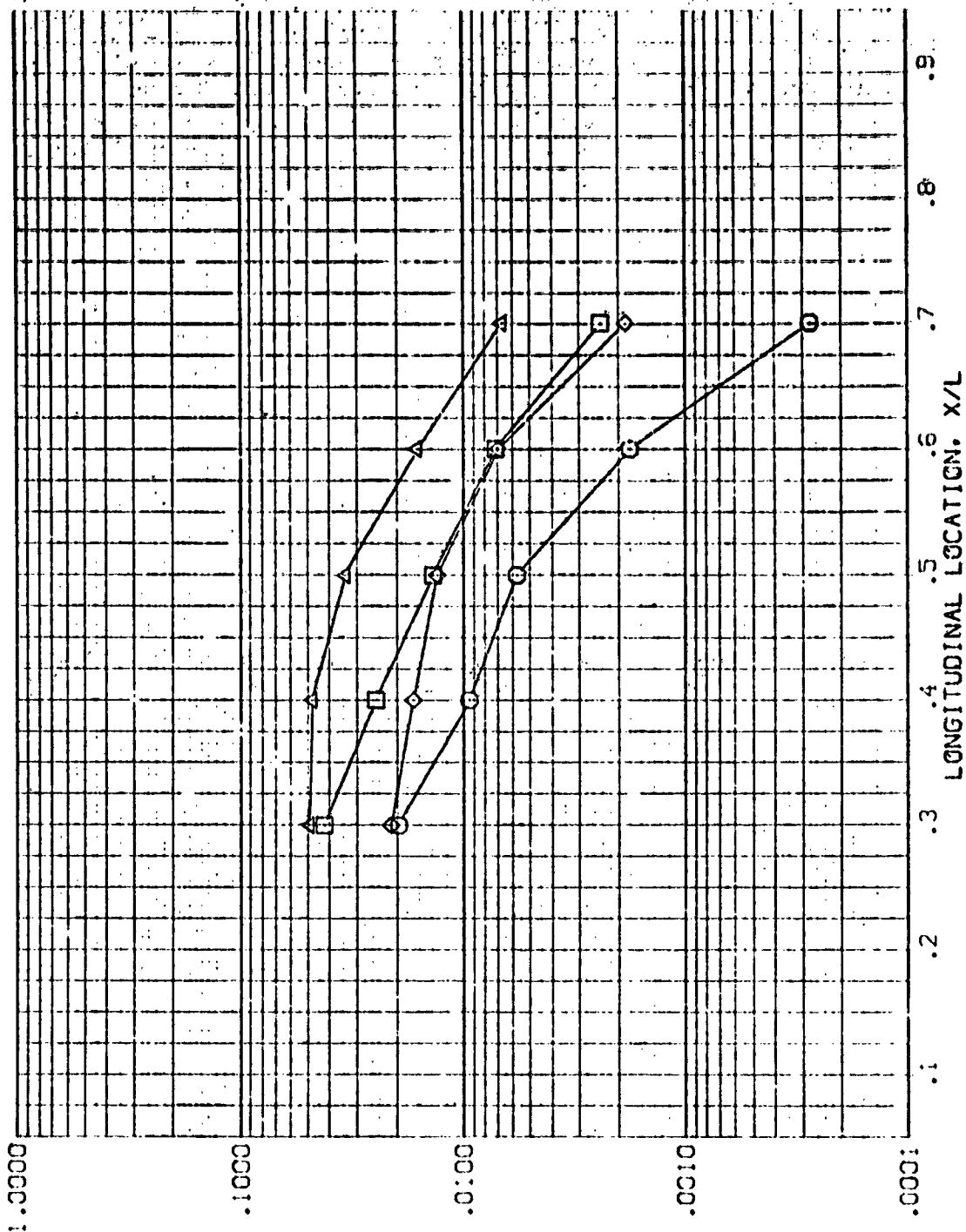
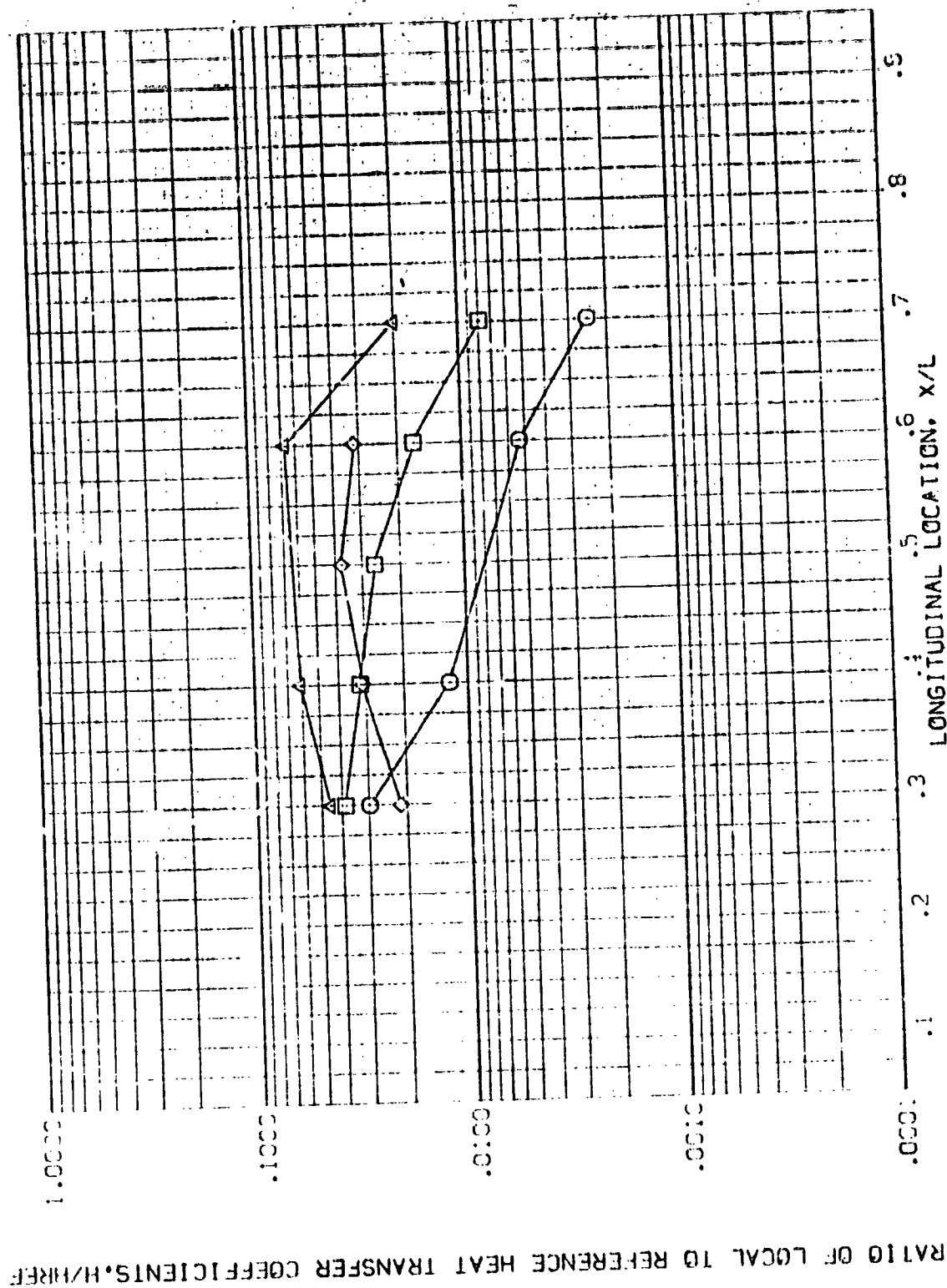


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

**SUBJECT**



LONGITUDINAL ECG STUDY IN PRESENCE OF THE TANK

2000

[illegible]

ALPHA RET%  
 30.000 .000  
 30.000 .000  
 60.000 .000  
 50.000 .000

CONFIGURATION DESCRIPTION  
 AVE 3.5-195 1428 01+T1 BODY SIDEWALL  
 AVE 3.5-195 1428 01+T1 BODY SIDEWALL  
 AVE 3.5-195 1428 01+T1 BODY SIDEWALL  
 AVE 3.5-195 1428 01+T1 BODY SIDEWALL

X (mm)  
 1.000  
 .100  
 .010  
 .001

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

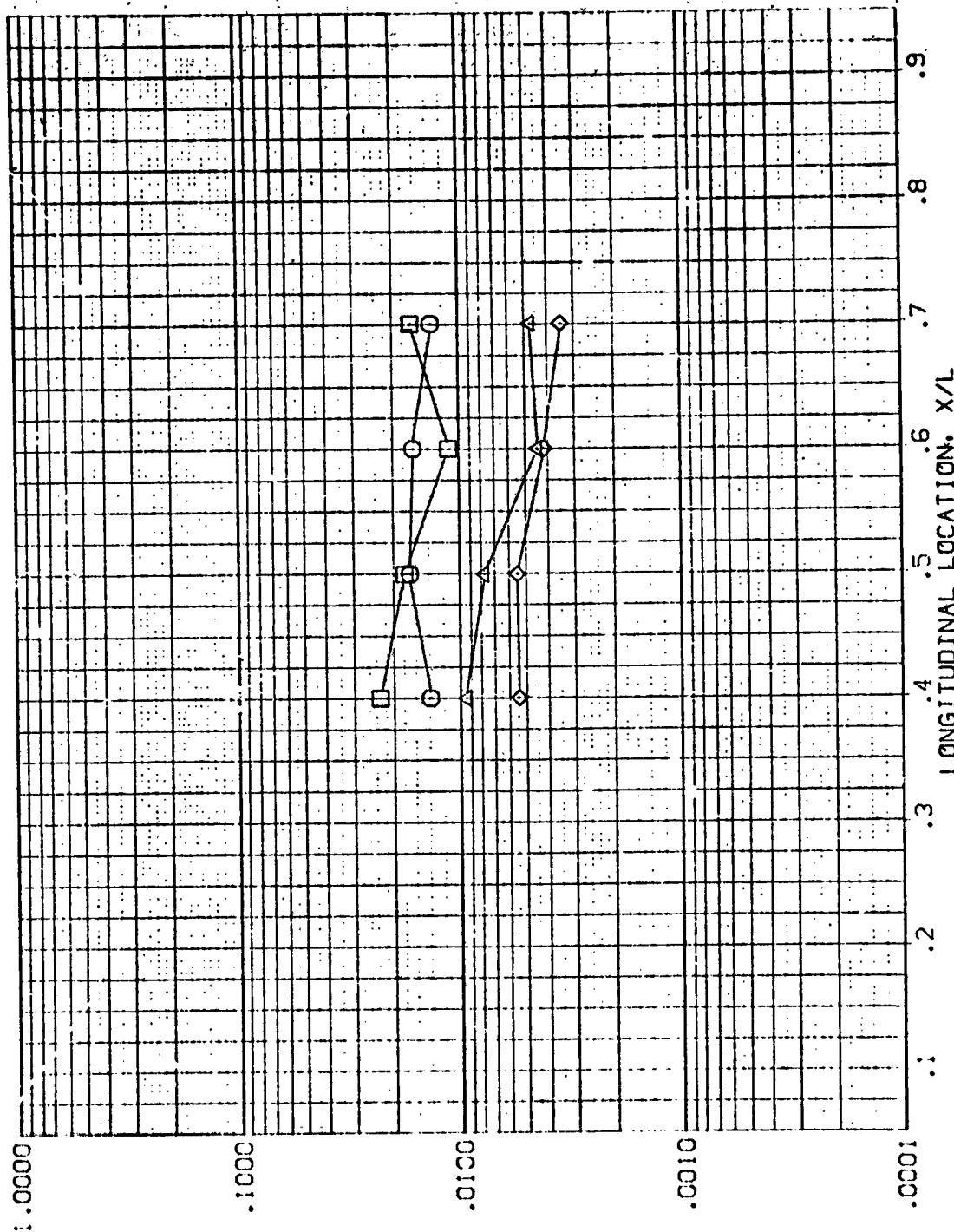


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HIT = .900 Z = 501.000

DATA SET SAVED: CONFIGURATION DESCRIPTION:  
 (RE-802) ASES 3.5-195 1428 01-T1 BODY SIDEWALL  
 (RE-812) ASES 3.5-195 1428 01-T1 BODY SIDEWALL

ALPHA BET/ EN/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

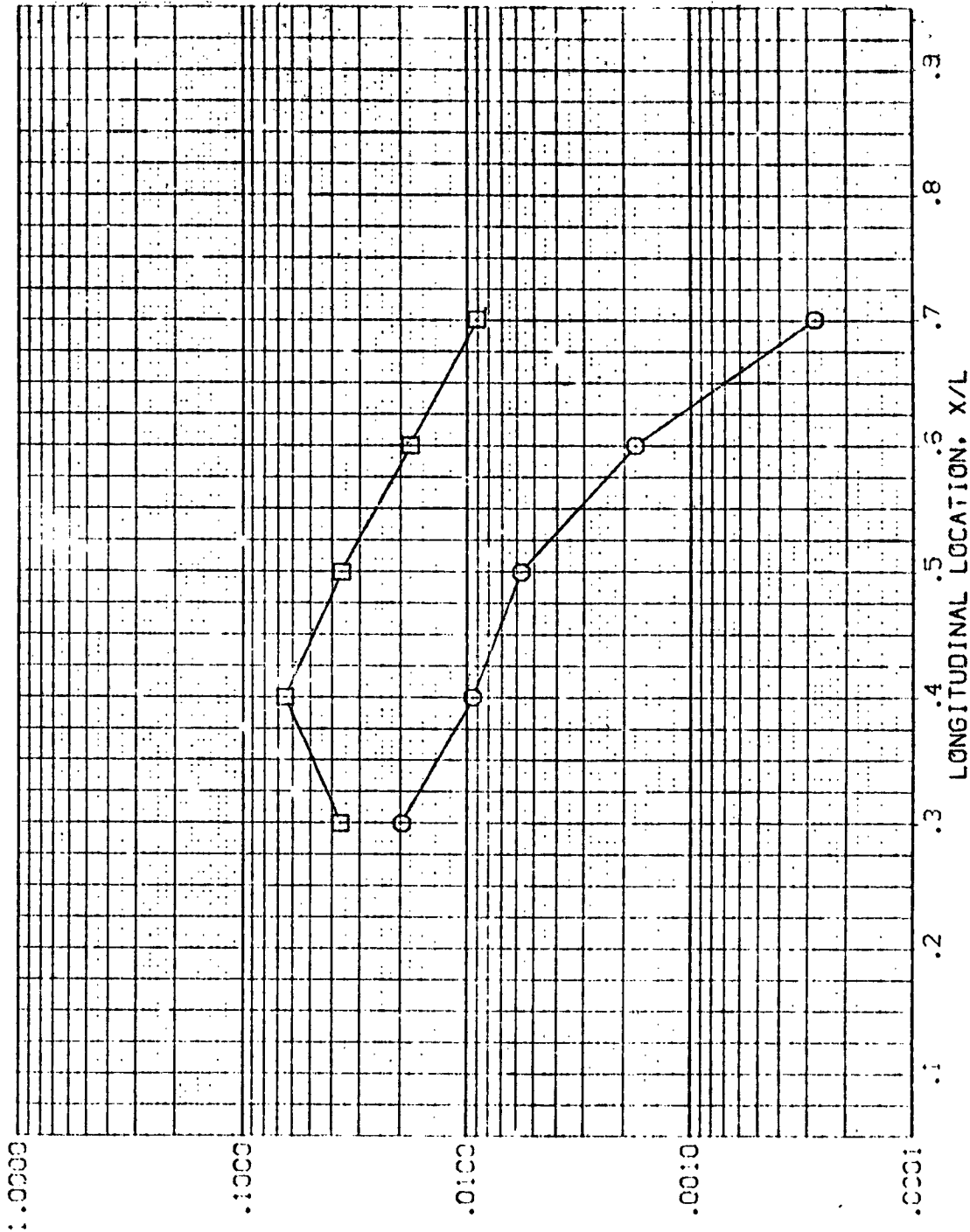


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.000 LAM/P = .900 Z = 375.000

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (RE1802) C AXES 3.5-195 (P28 01-T1) BODY SIDEWALL  
 (RE1812) C AXES 3.5-195 (P28 01-T1) BODY SIDEWALL

ALPHA BETA RV/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

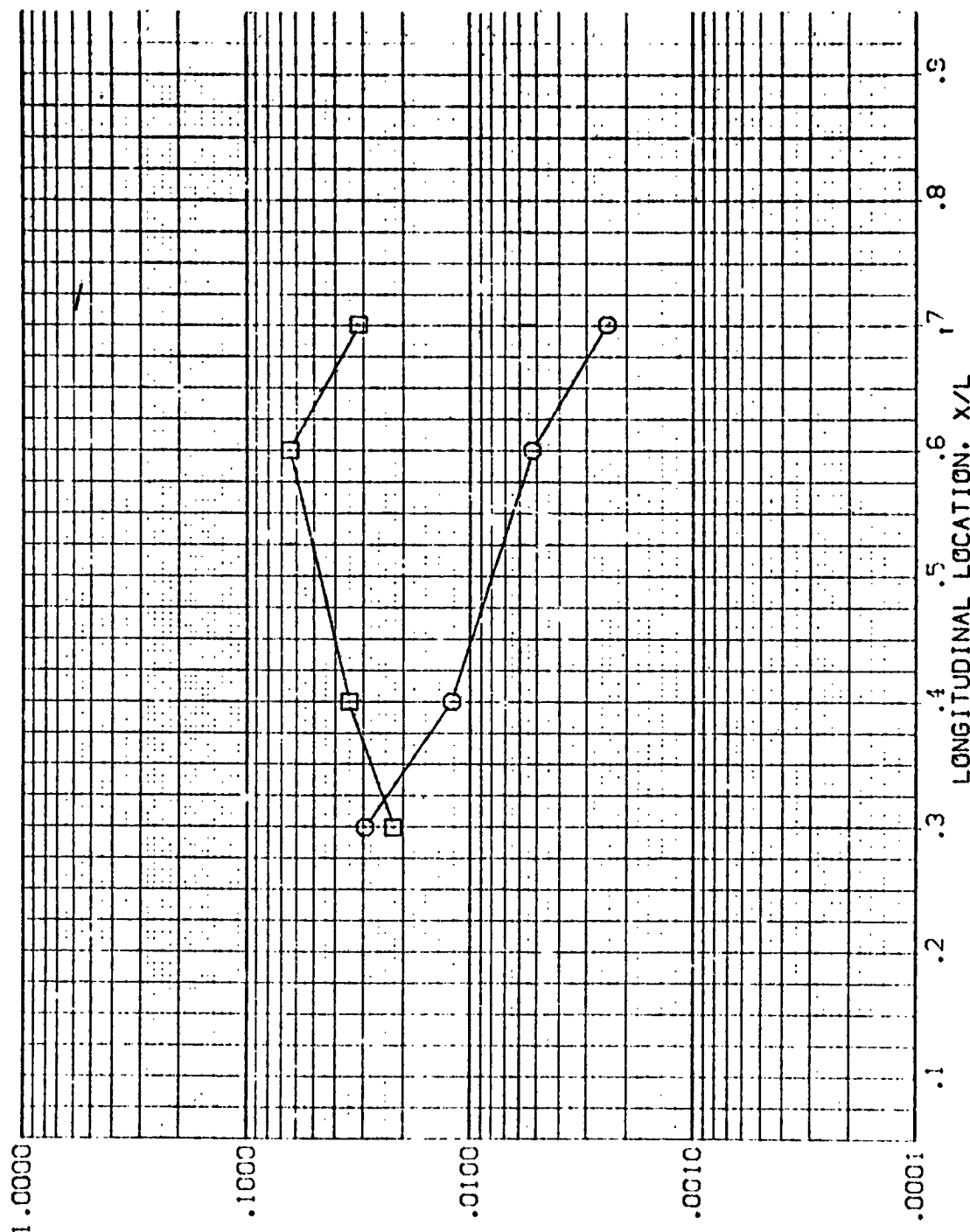


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 425.000



DATA SET SYMBOL: 3  
 (REVERSE)  
 CONFIGURATION DESCRIPTION:  
 AYES 3/3-135 1-28 01-11 BODY SIDEWALL  
 AYES 3/3-135 1-28 01-11 BODY SIDEWALL

ALPHA BETA  $\beta W/L$   
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

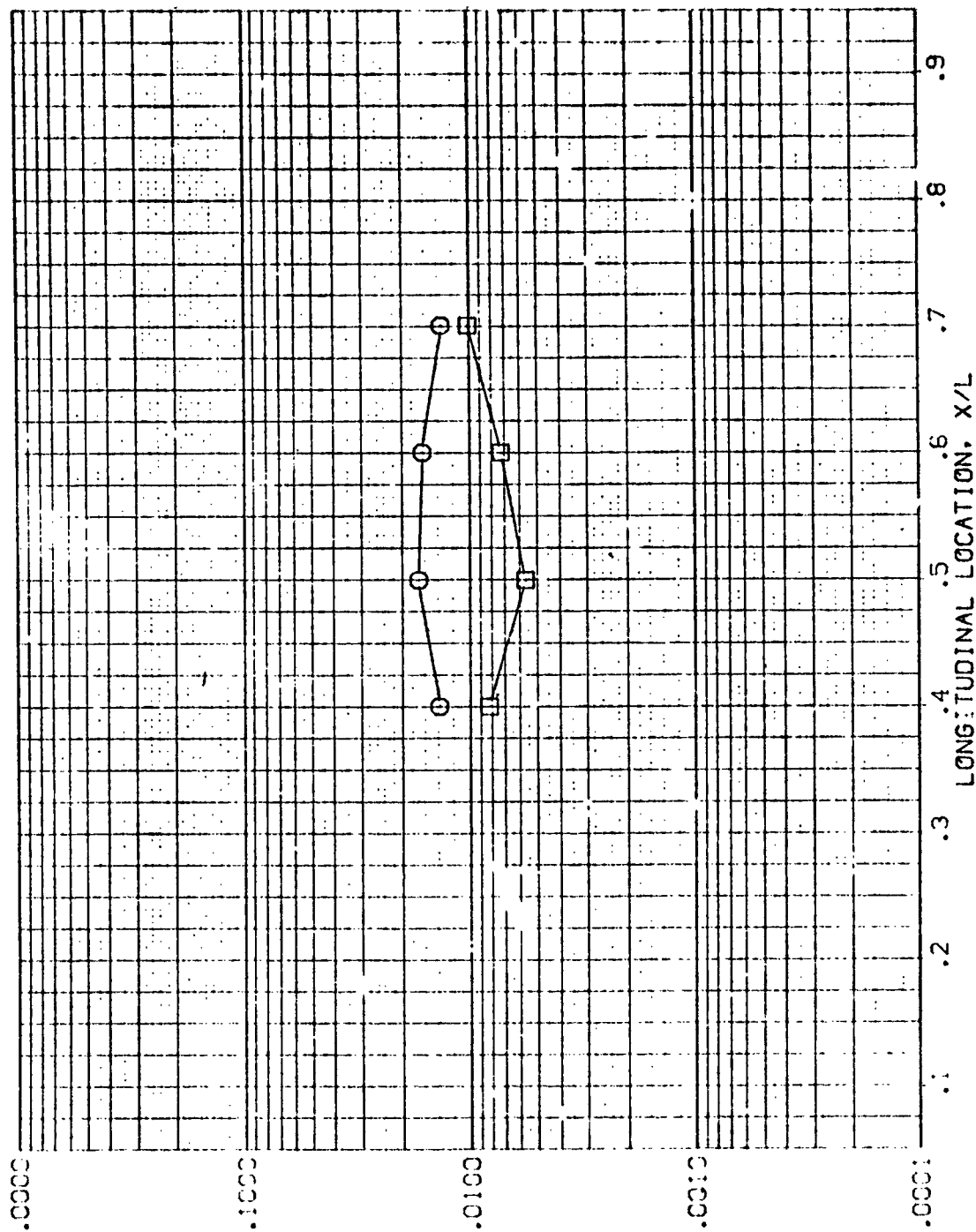


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.200  $W/H/T = .990$   $Z = 501.000$

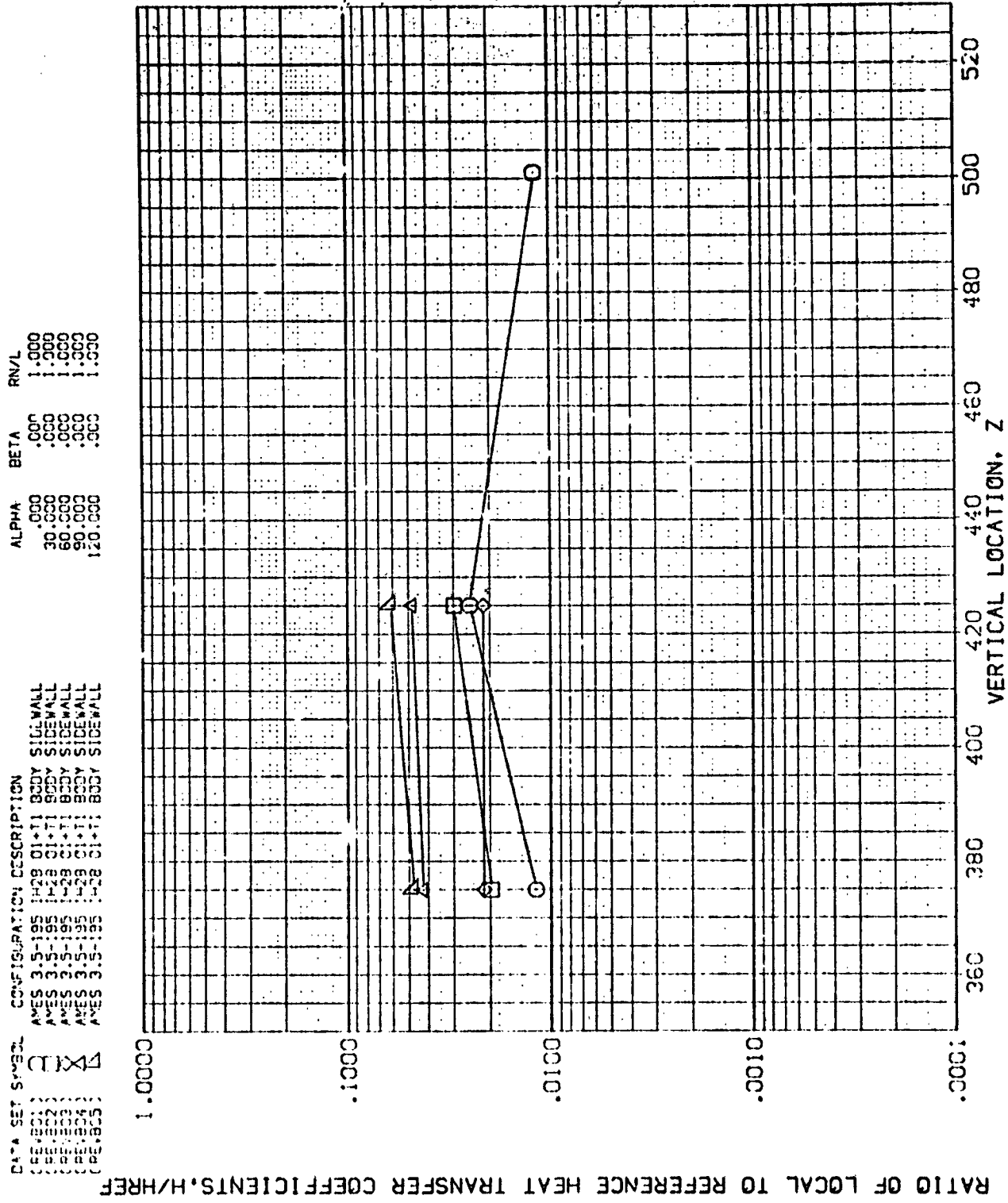


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

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00000  
00000  
00000

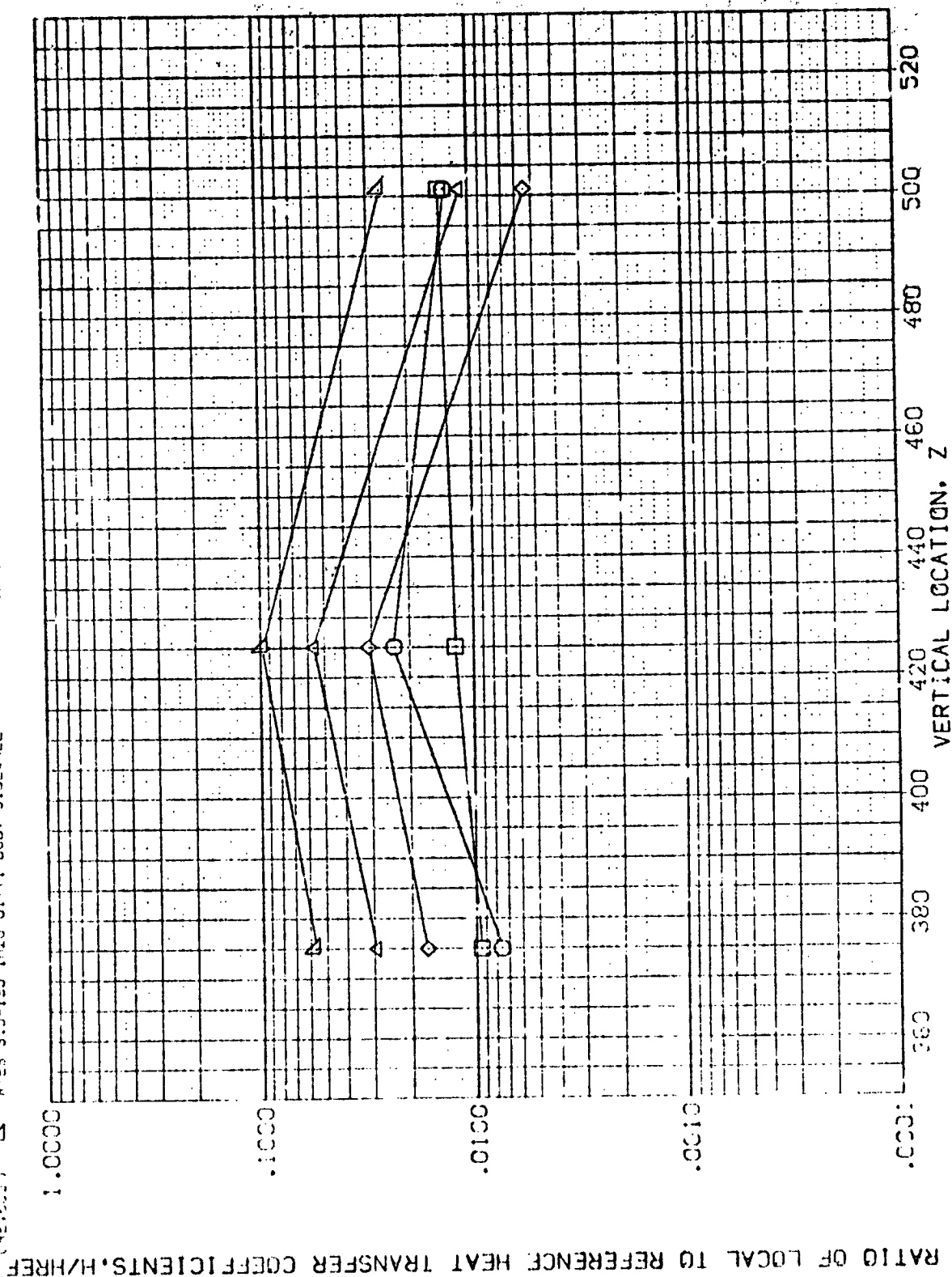


FIG. 11. ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK.

$$5.200 \times 10^4 / \text{PI} = .900 \times 10^4 = .400$$

DATA SET 5-102  
 (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

CONFIGURATION DESCRIPTION  
 AVE 3-5-105 (428 01+1) BODY SIDEWALL  
 AVE 3-5-105 (428 01+1) BODY SIDEWALL  
 AVE 3-5-105 (428 01+1) BODY SIDEWALL  
 AVE 3-5-105 (428 01+1) BODY SIDEWALL  
 AVE 3-5-105 (428 01+1) BODY SIDEWALL

ALPHA BETA RM/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

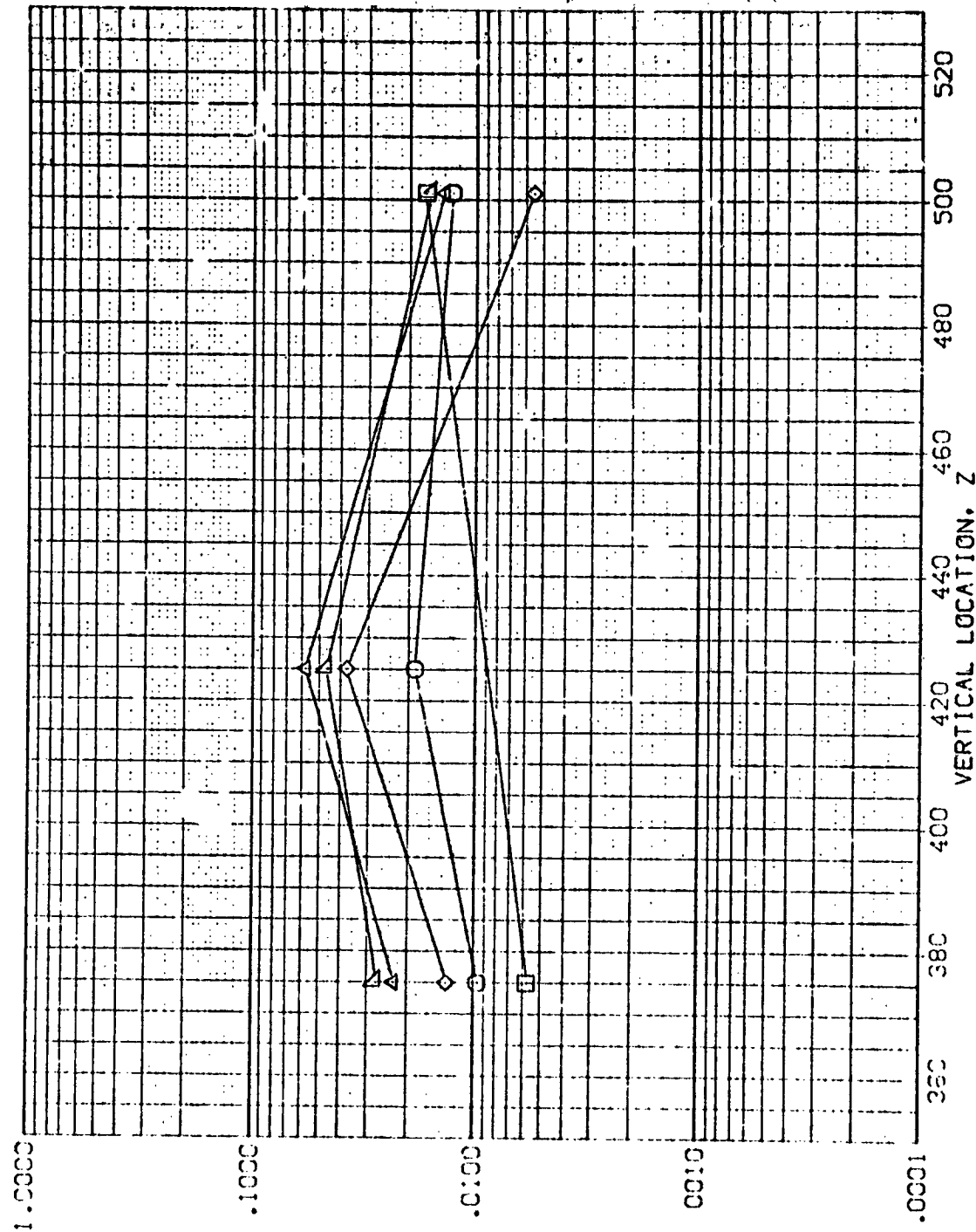
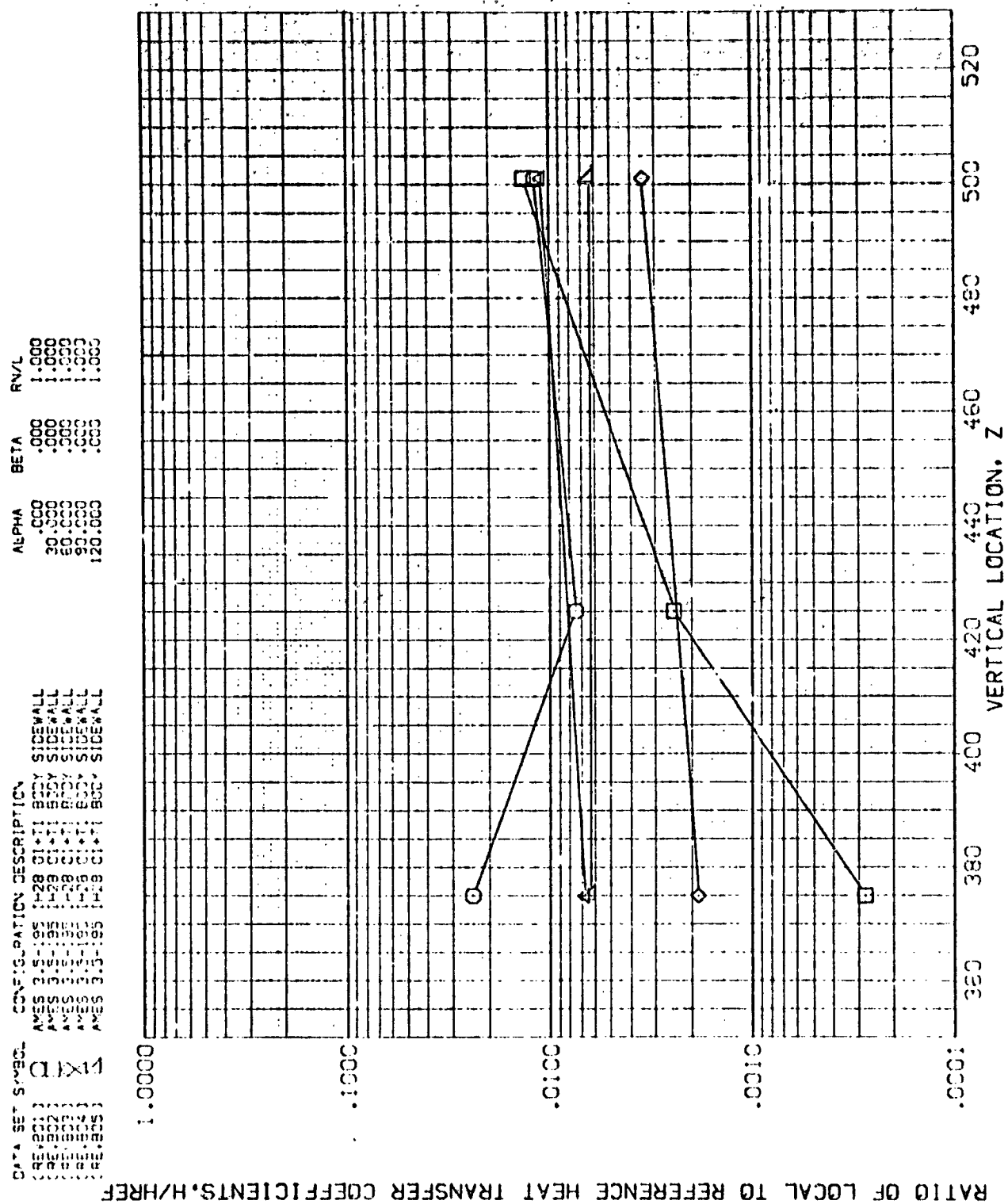


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.200 HAW/HT = .900 X/L = .500





RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h_{\text{local}}/h_{\text{ref}}$

[illegible]

ALPHA BETA RV/L

DESCRIPTION

DATA SET

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

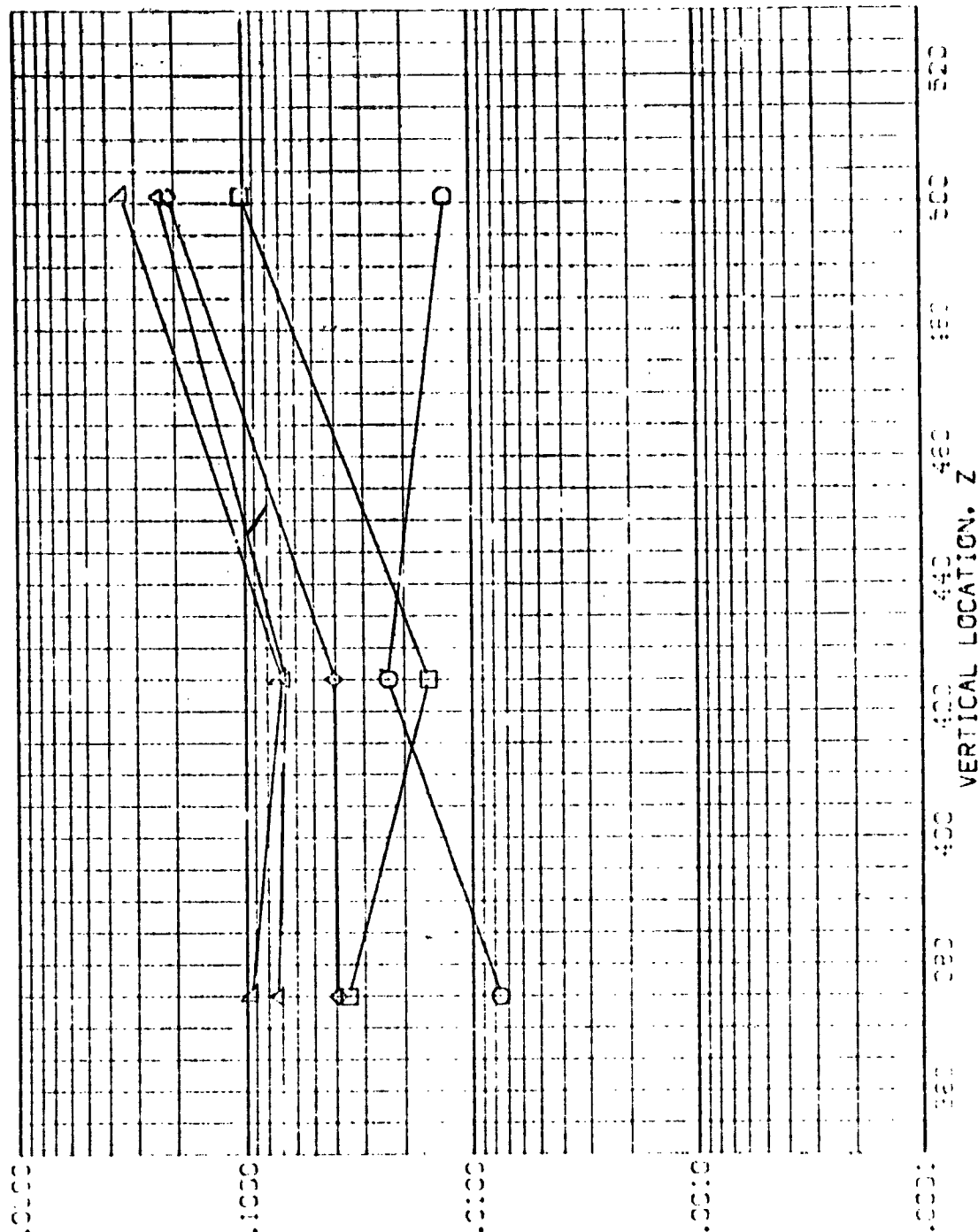


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

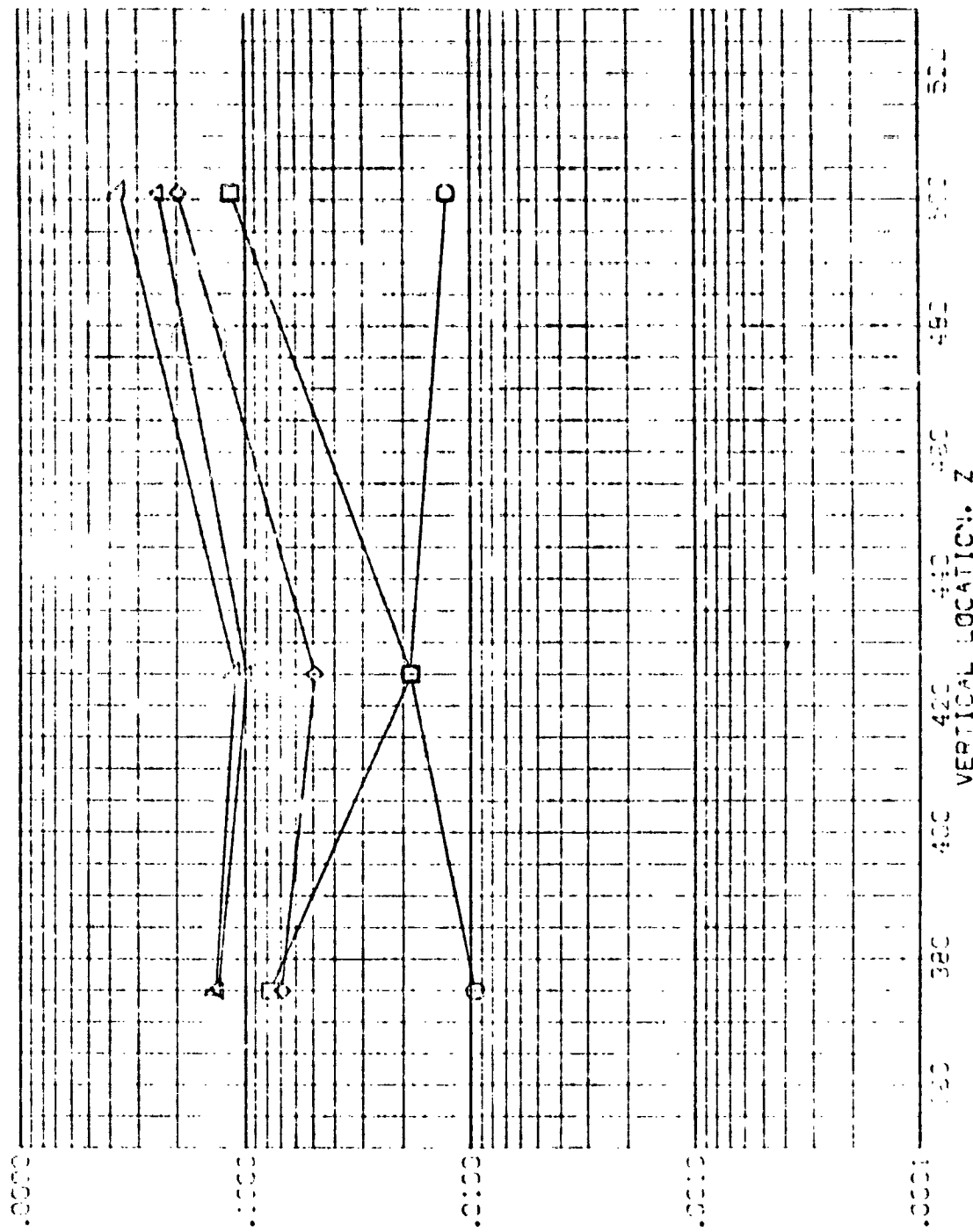
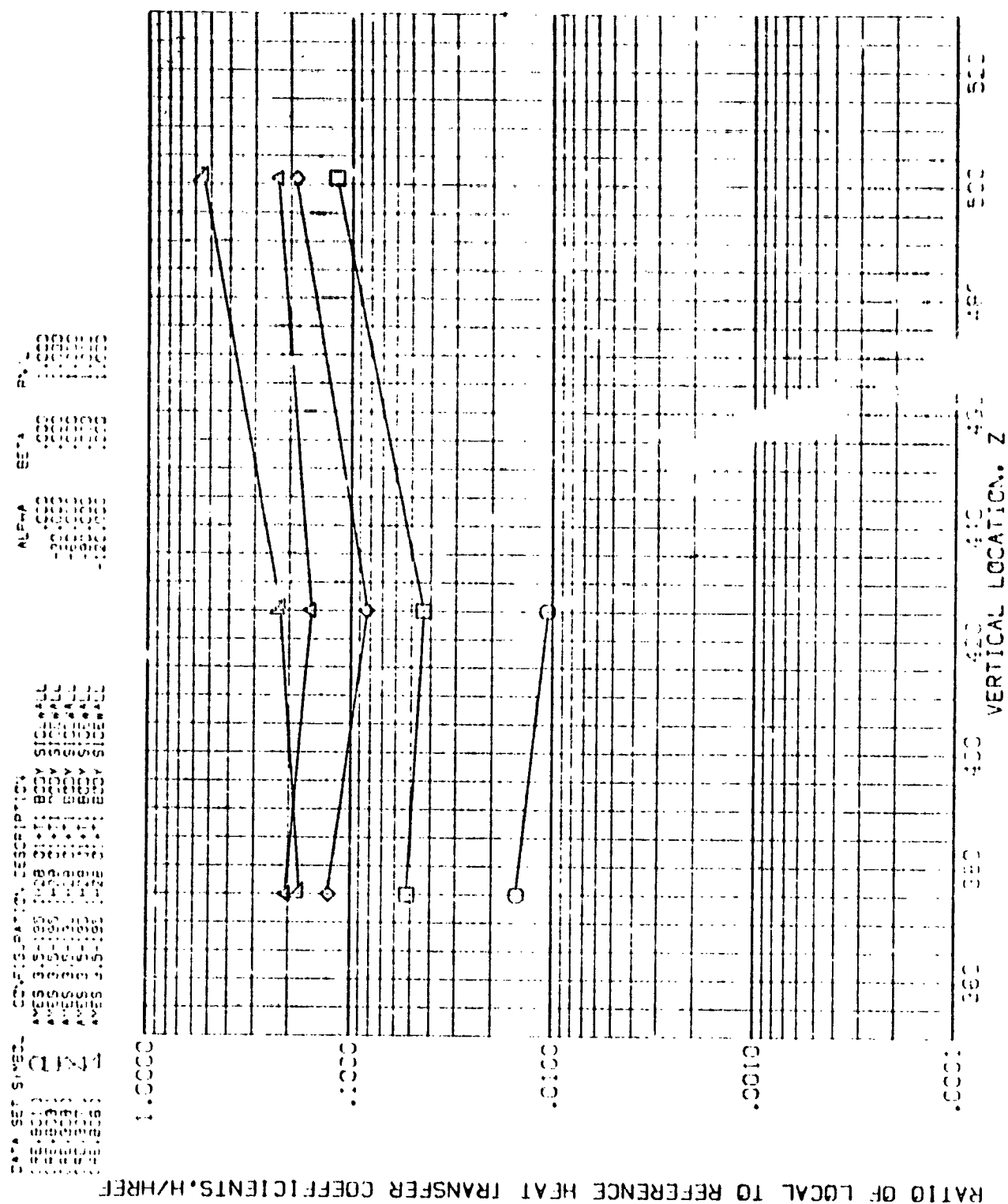


FIG. 11 CRESTER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



ALPHA	BETA	R <sup>2</sup> ΔL
.000	.000	1.000
-.30.000	.000	1.000
-.50.000	.000	1.000
-.90.000	.000	1.000
-.120.000	.000	1.000

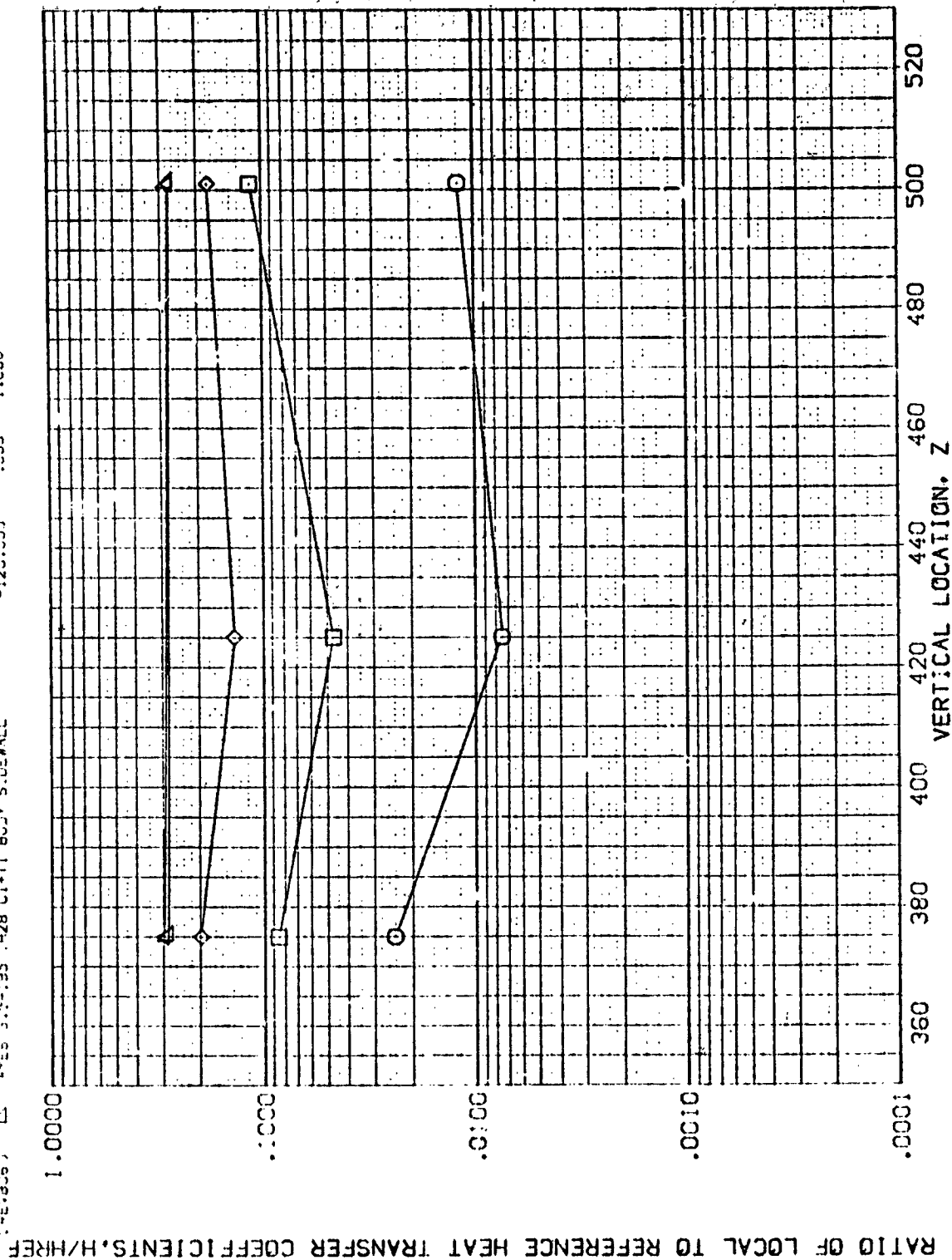


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

$$\text{MAG} = 5.300 \quad \text{L}^4/\text{H}^2 = .900 \quad \text{X/L} = .750$$

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (REV02) AXES 3.5-195 :428 01-T1 BODY SIDEWALL  
 (REV01) AXES 3.5-195 :428 01-T1 BODY SIDEWALL  
 (REV03) AXES 3.5-135 :428 01-T1 BODY SIDEWALL  
 (REV04) AXES 3.5-135 :428 01-T1 BODY SIDEWALL

ALPHA BET: RV/L  
 30.000 .000 1.000  
 30.000 .000 4.000  
 60.000 .000 1.000  
 60.000 .000 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

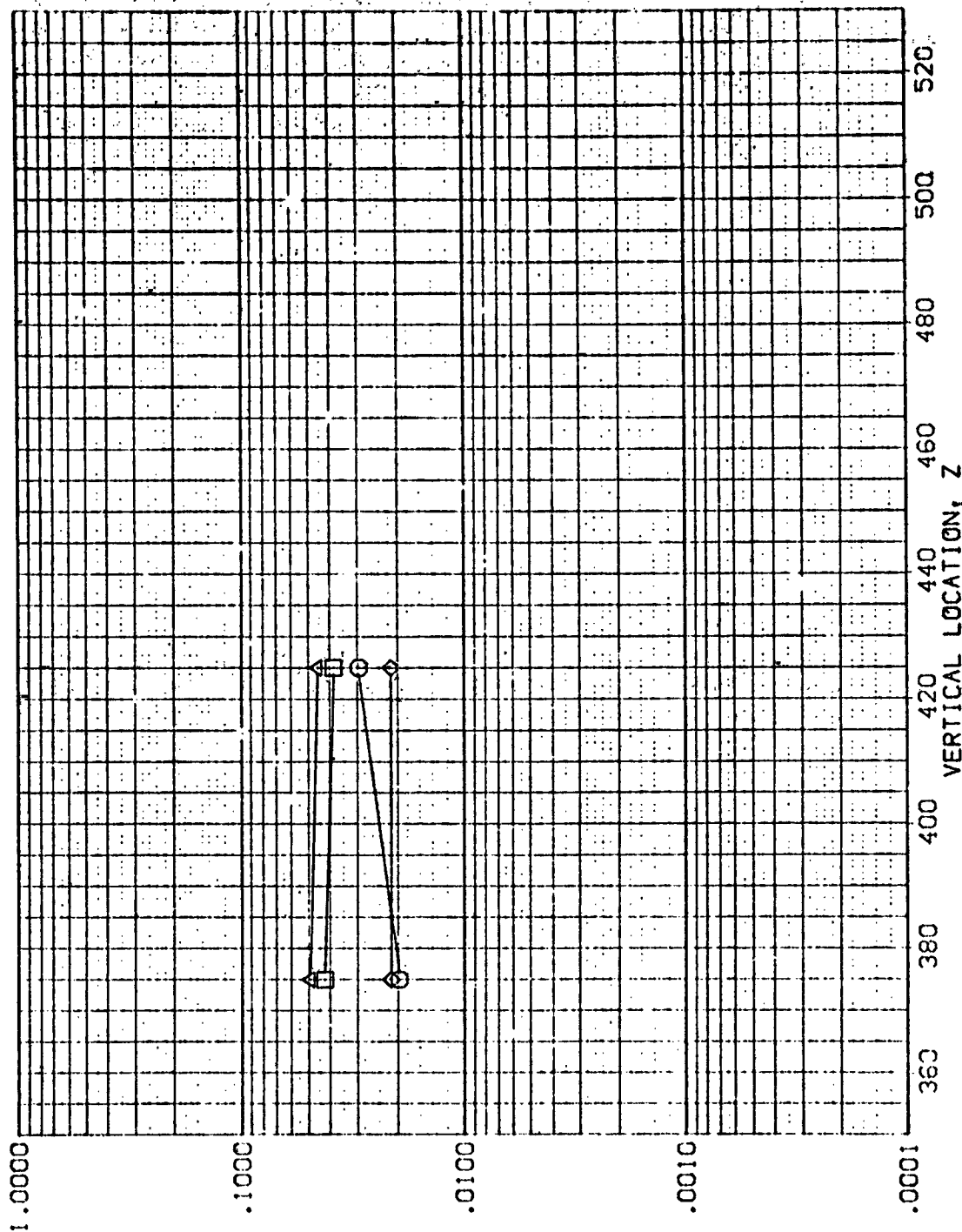


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 X/L = .300

DATA SET SYMBOL

(REB02)  
(REB01)  
(REB03)  
(REB10)

CONFIGURATION DESCRIPTION

AXES 3.5-195 1428 01+11 BODY SIDEWALL  
AXES 3.5-195 1428 01+11 BODY SIDEWALL  
AXES 3.5-195 1423 01+11 BODY SIDEWALL  
AXES 3.5-195 1428 01+11 BODY SIDEWALL

ALPHA BETA X/L  
30.000 .000 1.000  
30.000 .000 4.000  
60.000 .000 1.000  
60.000 .000 4.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

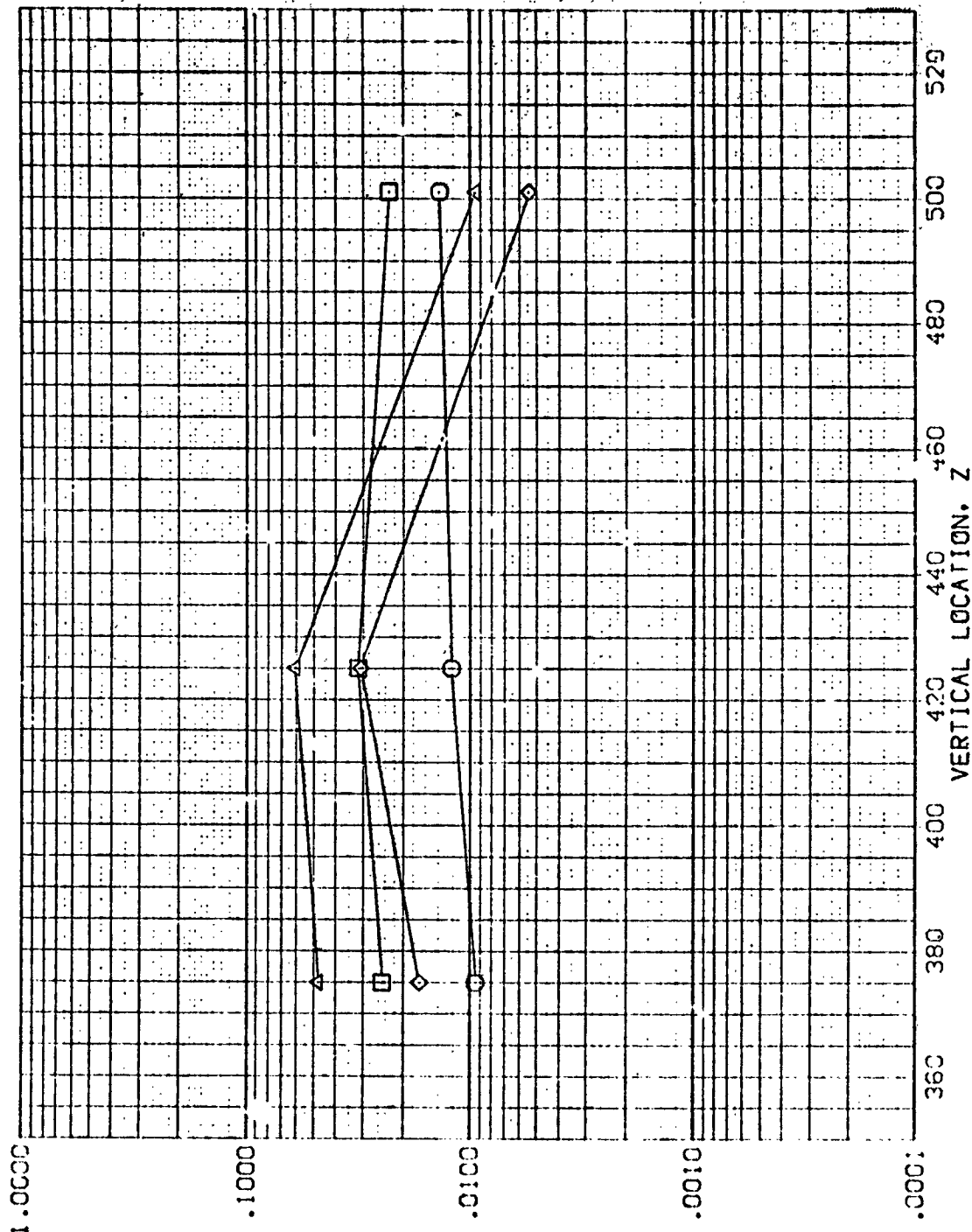


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 X/L = .400

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	KN/L
AMES 3.5-195	1428 01-11 BODY SIDEWALL	30.000	.000	1.000
AMES 3.5-195	1428 01-11 BODY SIDEWALL	30.000	.000	4.000
AMES 3.5-195	1428 01-11 BODY SIDEWALL	60.000	.000	1.000
AMES 3.5-195	1428 01-11 BODY SIDEWALL	60.000	.000	4.000

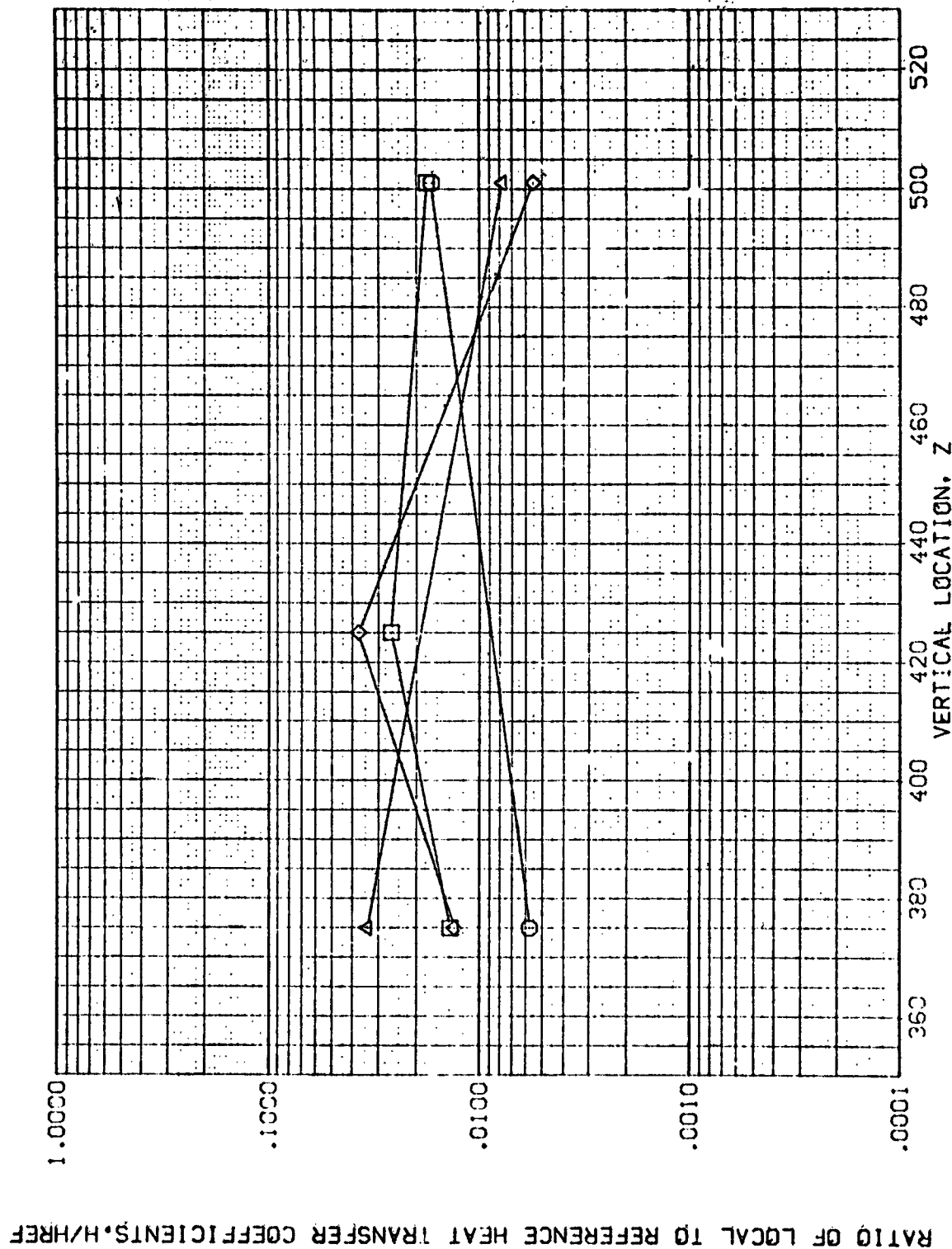


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300  $\mu = 1.0 \times 10^{-4}$   $\gamma = 1.4$   $X/L = .500$

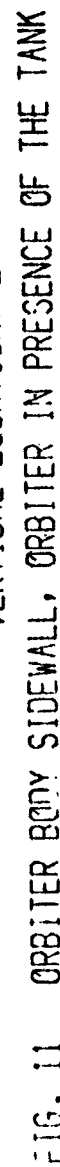
RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$ 

FIG. 11 UNBIDDEN BOND SIDEWALLY UNBIDDEN IN PRESENCE OF

PAGE 650

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
01-021	AVES 3-5-195 1428 01-11 BODY SIDEWALL	30.000	.000	1.000
01-022	AVES 3-5-195 1428 01-11 BODY SIDEWALL	30.000	.000	4.000
01-023	AVES 3-5-195 1428 01-11 BODY SIDEWALL	60.000	.000	1.000
01-024	AVES 3-5-195 1428 01-11 BODY SIDEWALL	60.000	.000	4.000

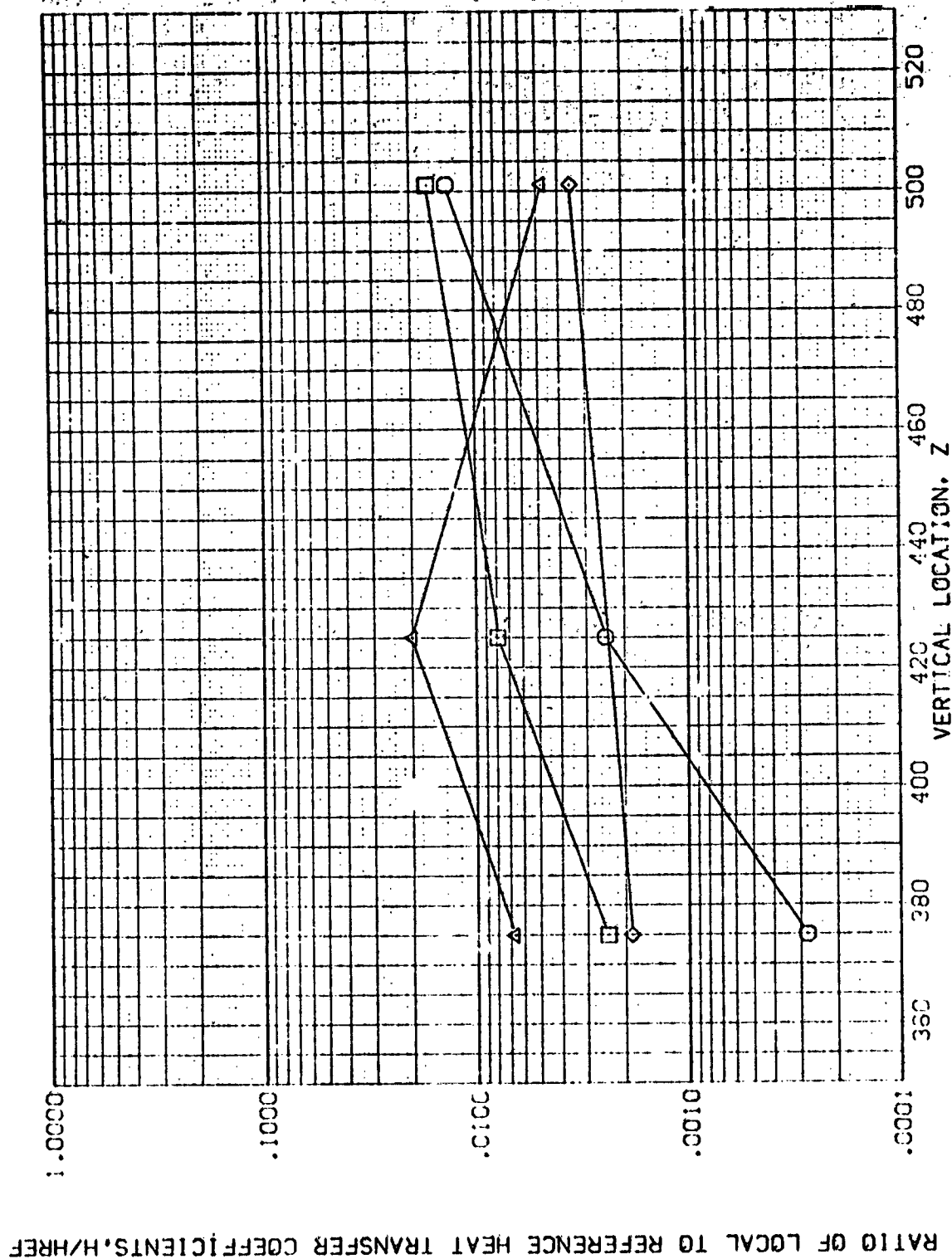


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK



DATA SET SYMBOL: (REV 302) B  
 CONFIGURATION DESCRIPTION: AMES 3.5-195 (H28 01.11) BODY SIDEWALL  
 AMES 3.5-195 (H28 01.11) BODY SIDEWALL

ALPHA BETA PNT  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

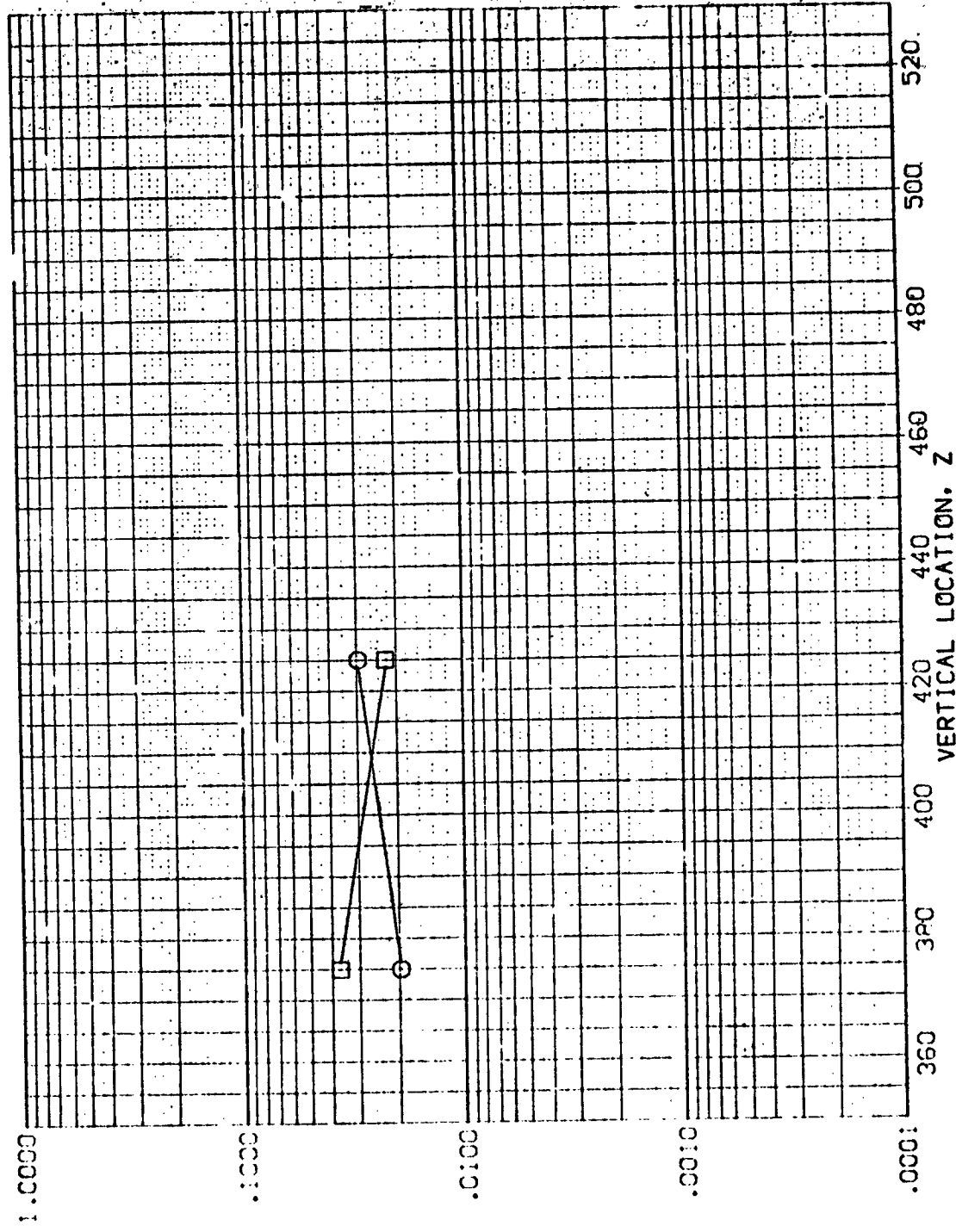


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 LAM/HT = .900 X/L = .300

DATA SET SVSCL  
(RE:BD2)  
(RE:BD2)

CONFIGURATION DESCRIPTION

AVES 3.5-195 1-28 01-11 BODY SIDEWALL  
AVES 3.5-195 1-28 01-11 BODY SIDEWALL

ALPHA BETA RN/L  
30.000 -5.000 1.000  
30.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

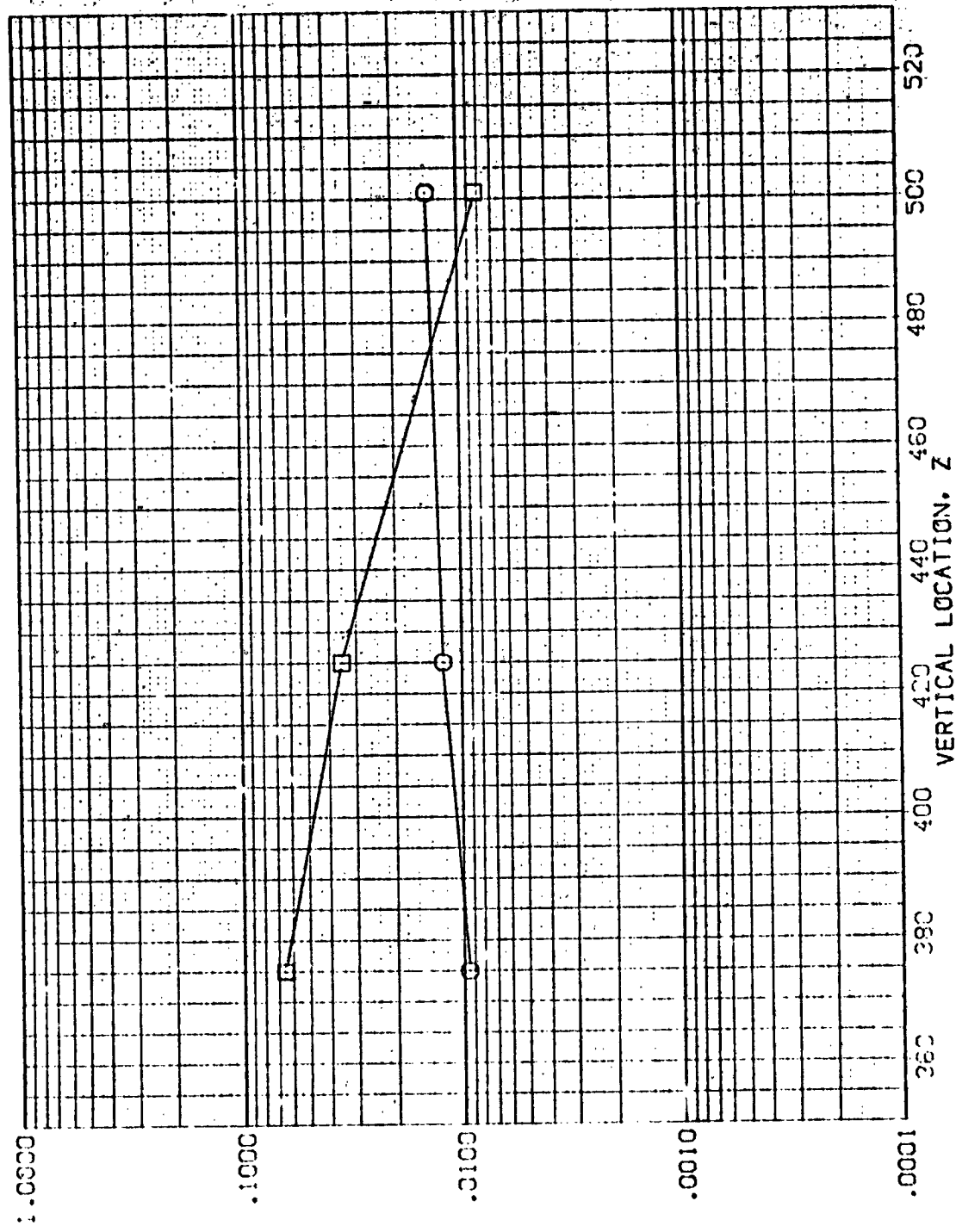


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

W/D = 5.300 HAY/LT = .900 X/L = .400

DATA SET SYMBOL: 8  
 (REVISED) 1  
 (REVISED) 2

CONFIGURATION DESCRIPTION

AVES 3.5-195 1423 01-11 BODY SIDEWALL  
 AVES 3.5-195 1428 01-11 BODY SIDEWALL

ALPHA BETA RV/L  
 30.000 0.000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

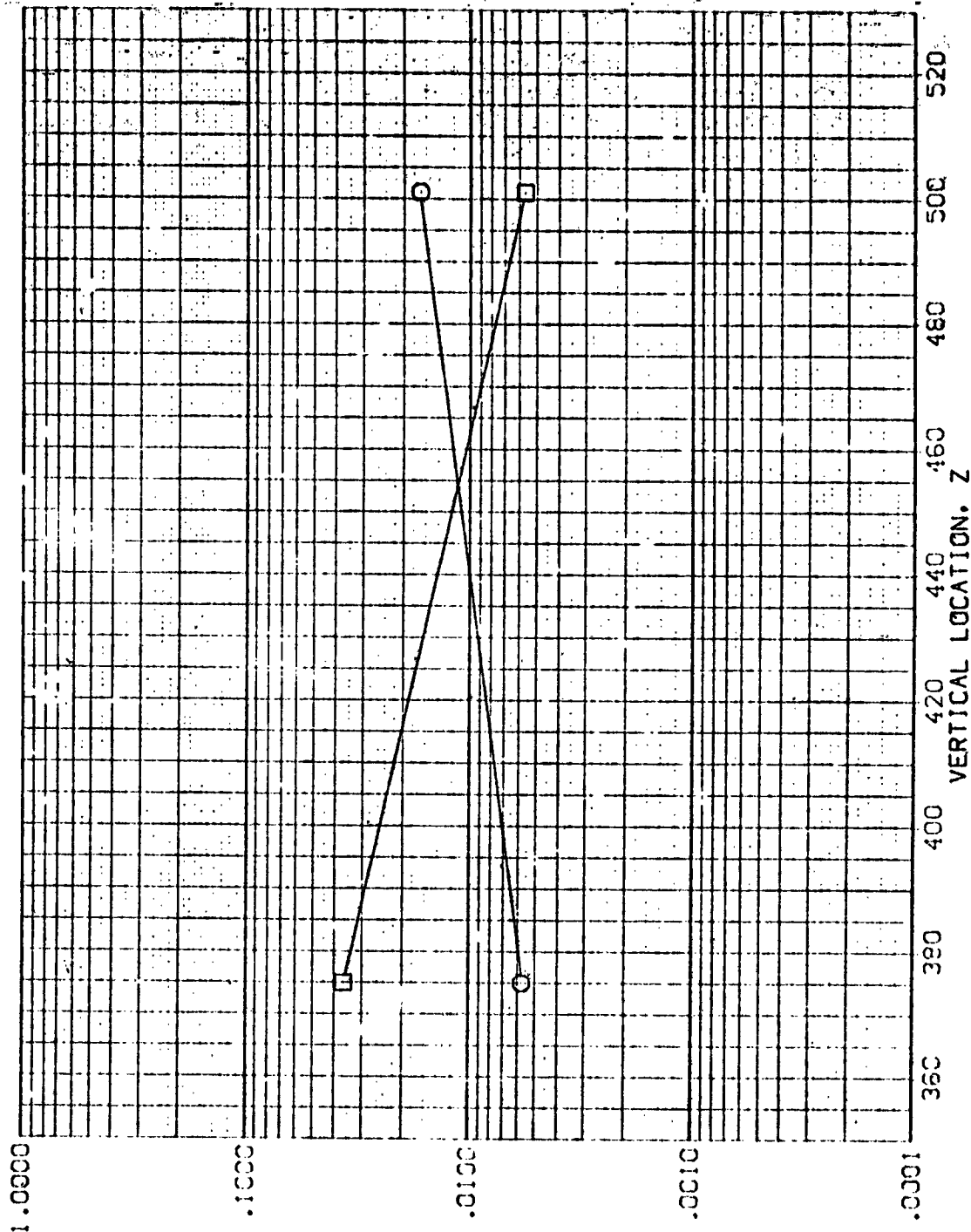


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 H/W/HREF = .900 X/L = .500

DATA SET SYMB. CONFIGURATION DESCRIPTION  
 (REV82) 8 AXES 3.5-195 1-28 01-11 BODY SIDEWALL  
 (REV812) 8 AXES 3.5-195 1-28 01-11 BODY SIDEWALL

ALPHA BET1 RN/L  
 30.000 .000 1.000  
 30.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

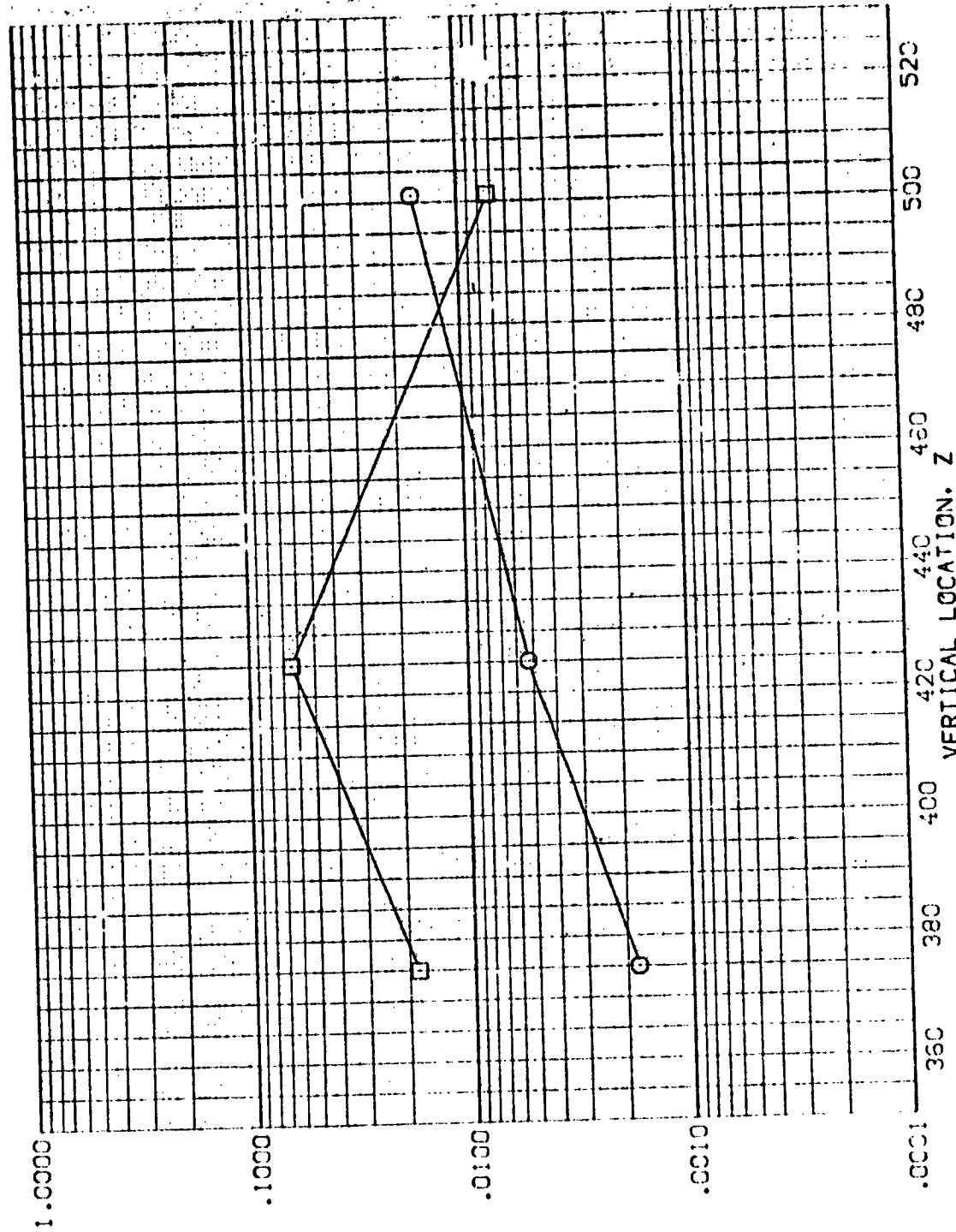


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

MAC = 5.300  $\mu$ W/LT = .900 X/L = .600

1. 1000  
2. 1000  
3. 1000  
4. 1000  
5. 1000  
6. 1000  
7. 1000  
8. 1000  
9. 1000  
10. 1000  
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66. 1000  
67. 1000  
68. 1000  
69. 1000  
70. 1000  
71. 1000  
72. 1000  
73. 1000  
74. 1000  
75. 1000  
76. 1000  
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81. 1000  
82. 1000  
83. 1000  
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85. 1000  
86. 1000  
87. 1000  
88. 1000  
89. 1000  
90. 1000  
91. 1000  
92. 1000  
93. 1000  
94. 1000  
95. 1000  
96. 1000  
97. 1000  
98. 1000  
99. 1000  
100. 1000

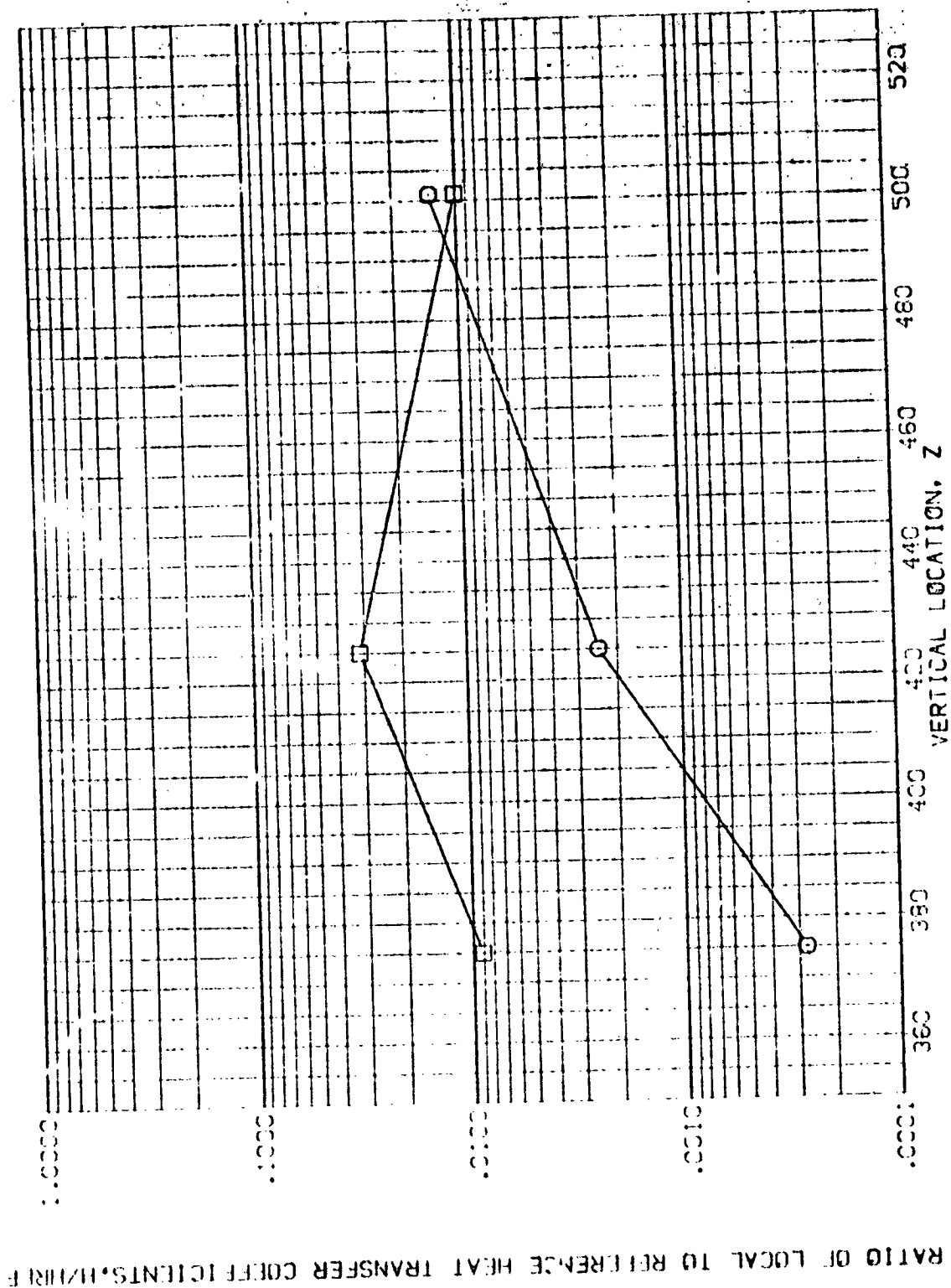


FIG. 11 ORBITER BODY SIDEWALL, ORBITER IN PRESENCE OF THE TANK

PAGE 656

	=	.96	X J.	=	
	=	14.7%		=	
	=	10.11		=	

RATES 2.5-1.95 1428 01+T: BODY SIDEWALL (BEVBC1)  
 PARAMETRIC VALUES  
 .000 BETA .000  
 .000 ALPHA  
 1.000 RV/L  
 375.000  
 425.000  
 501.000

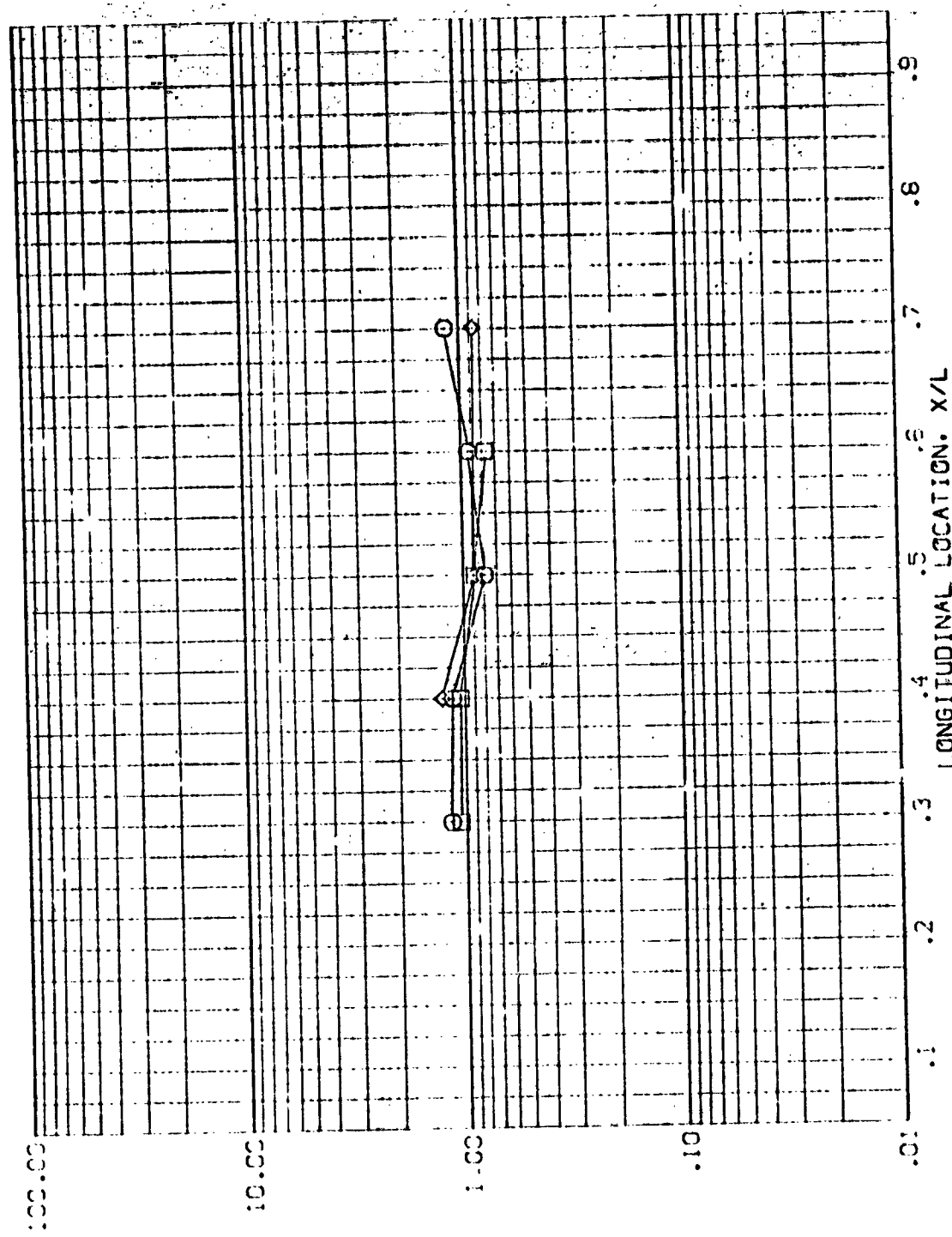


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

SYMBOL Z HAW/HT MACH A/D/A P/D/A  
375.000 .900 5.219  
425.000  
501.000

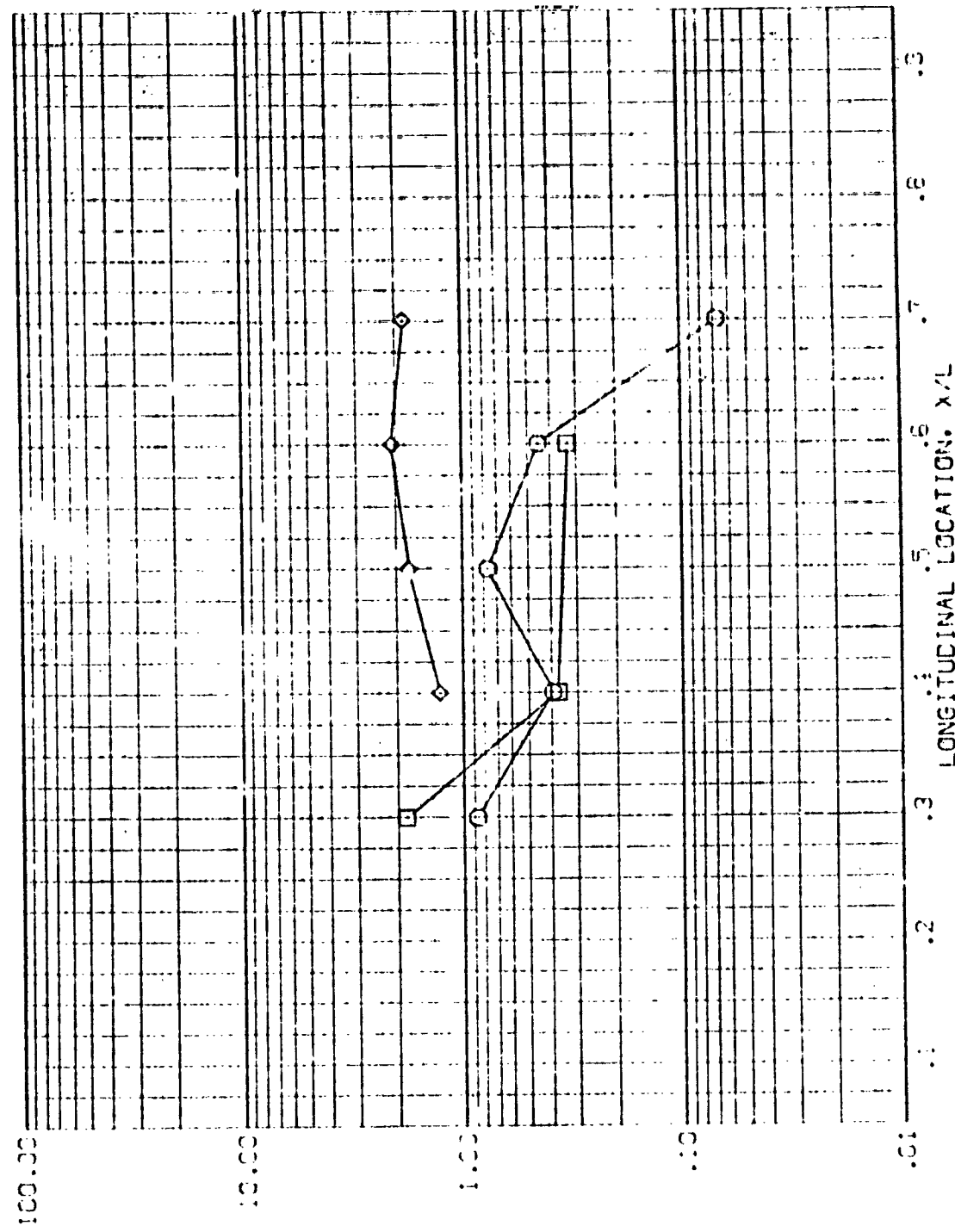
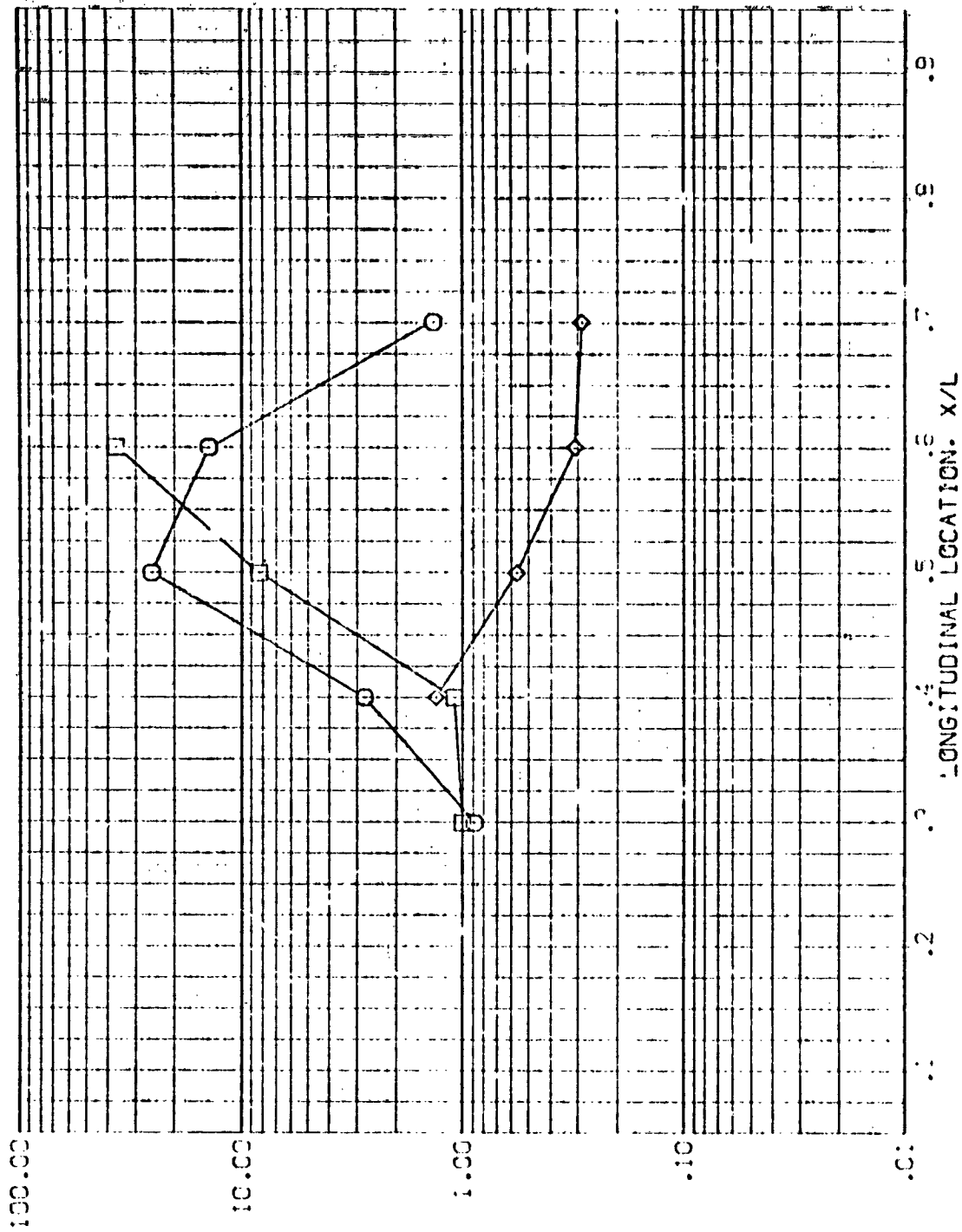


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

SYSES- Z 375.000 425.000 501.000  
 HAW/MT 1.900 5.220  
 VACH  
 AVES 3.5-105 1-28 01-71 BODY SIDEWALL (9EVB03)  
 DISAEMETRIC VALUES  
 ALPHA 60.000 BETA 1.000  
 RA/L



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 BODY SIDEWALL (BEV804)

PARAMETRIC VALUES  
 90.000  $\alpha$  1.000  $\beta$  .000

ALPHA  
 RV/L

HAW/HT .900 MACH 5.219

SECT Z  
 375.000  
 425.000  
 501.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

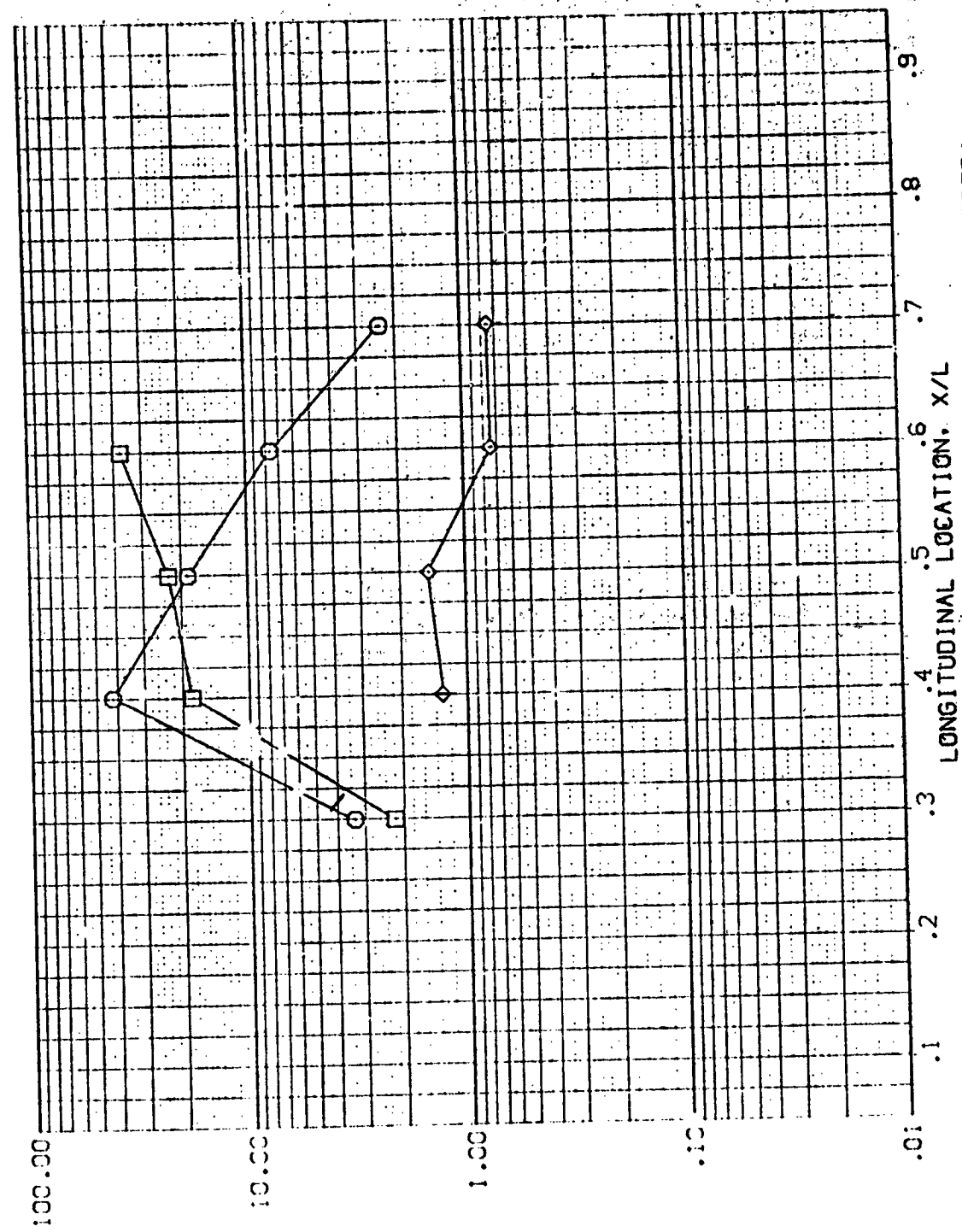


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-:95 IH28 01+T1 BODY SIDEWALL

(BEVB05)

SYNTHETIC  
 Z  
 375.000  
 425.000  
 501.000

HAW/HT MACH  
 .900 5.220

PARAMETRIC VALUES  
 120.000 BETA .000  
 ALPHA  
 RV/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

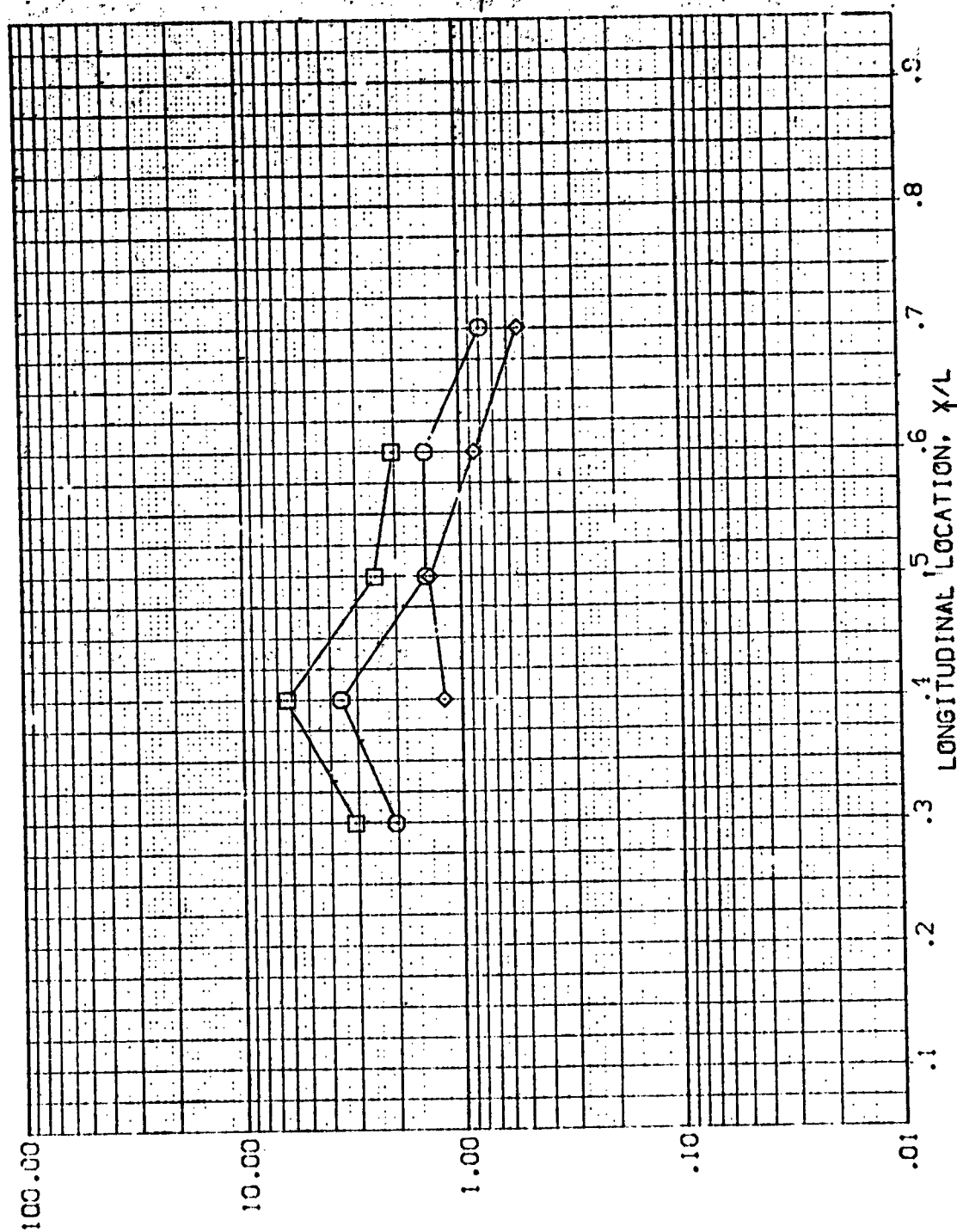


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(SEVB06)

SYMBOL  
 375.000  
 425.000  
 501.000

HAW/HF MACH  
 .900 5.220

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA 1.000  
 RN/L .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

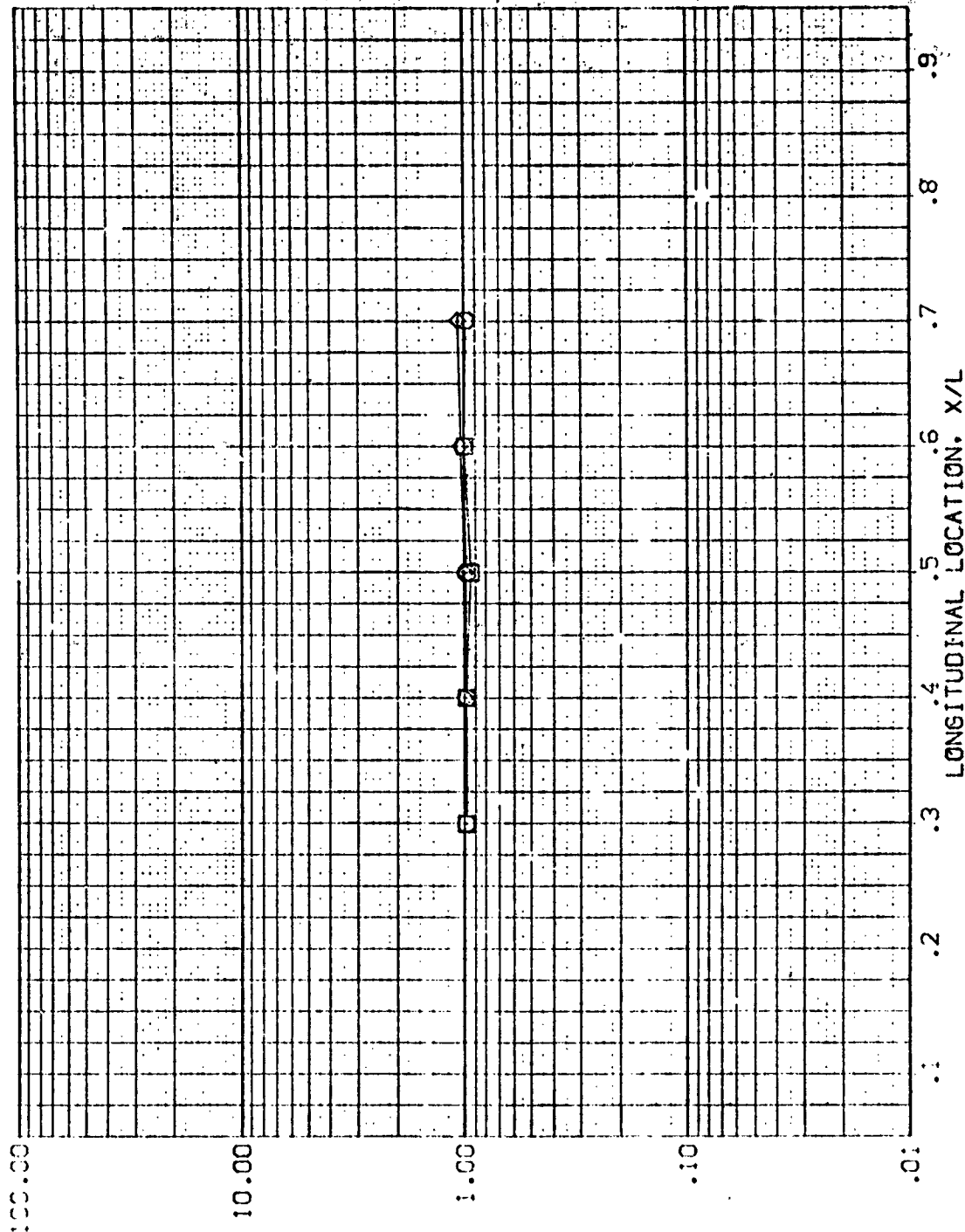


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(BEVB07)

SYMBOL  
 375.000  
 425.000  
 501.000

HAWAHT MACH  
 .900 5.219

PARAMETRIC VALUES  
 ALPHA -90.000 BETA .000  
 RN/E 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

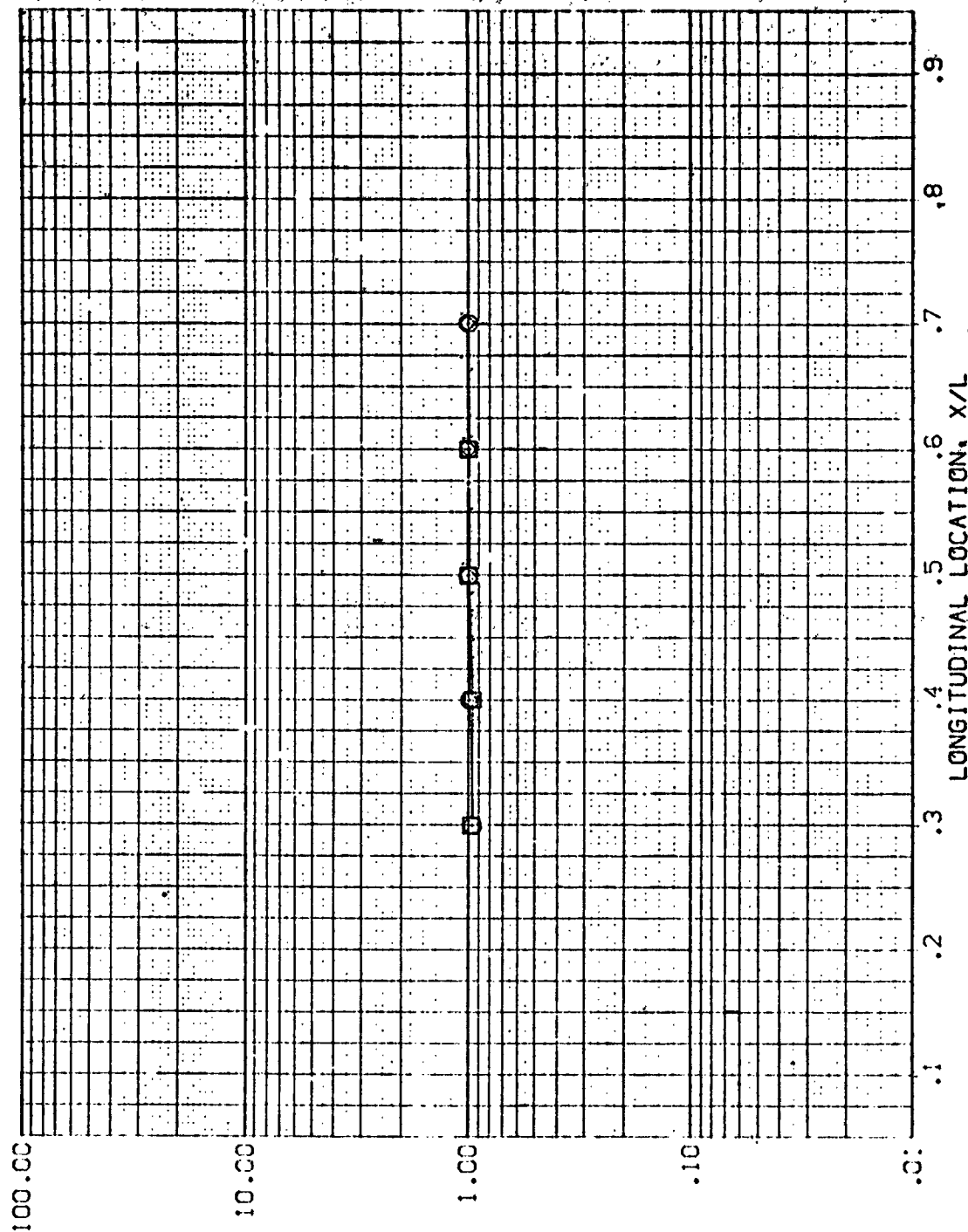


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

(BEVB08)

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYMBOL Z HAW/H<sub>T</sub> MACH  
375.000  
425.000  
501.000

PARAMETRIC VALUES  
ALPHA  
R<sub>W</sub>/L  
-60.000  
1.000  
BETA  
1.000  
.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

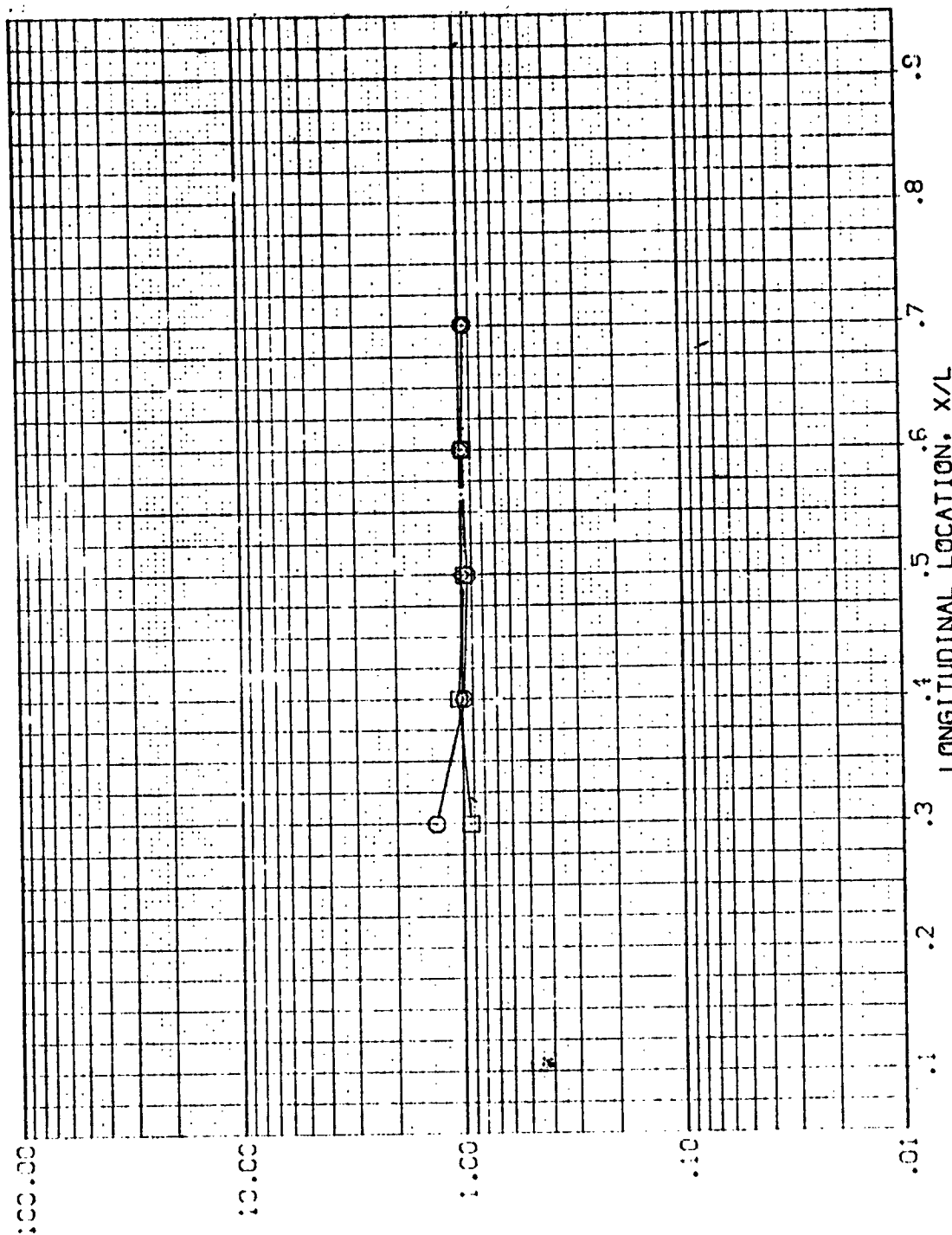


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

ANES 3.5-195 1-28 01+T1 BODY SIDEWALL

(BEVB09)

SYMBOL

375.000  
425.000  
501.000

HAW/HT MACH  
.900 5.220

PARAMETRIC VALUES  
ALPHA -30.000  
RN/E 1.000  
BETA .000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

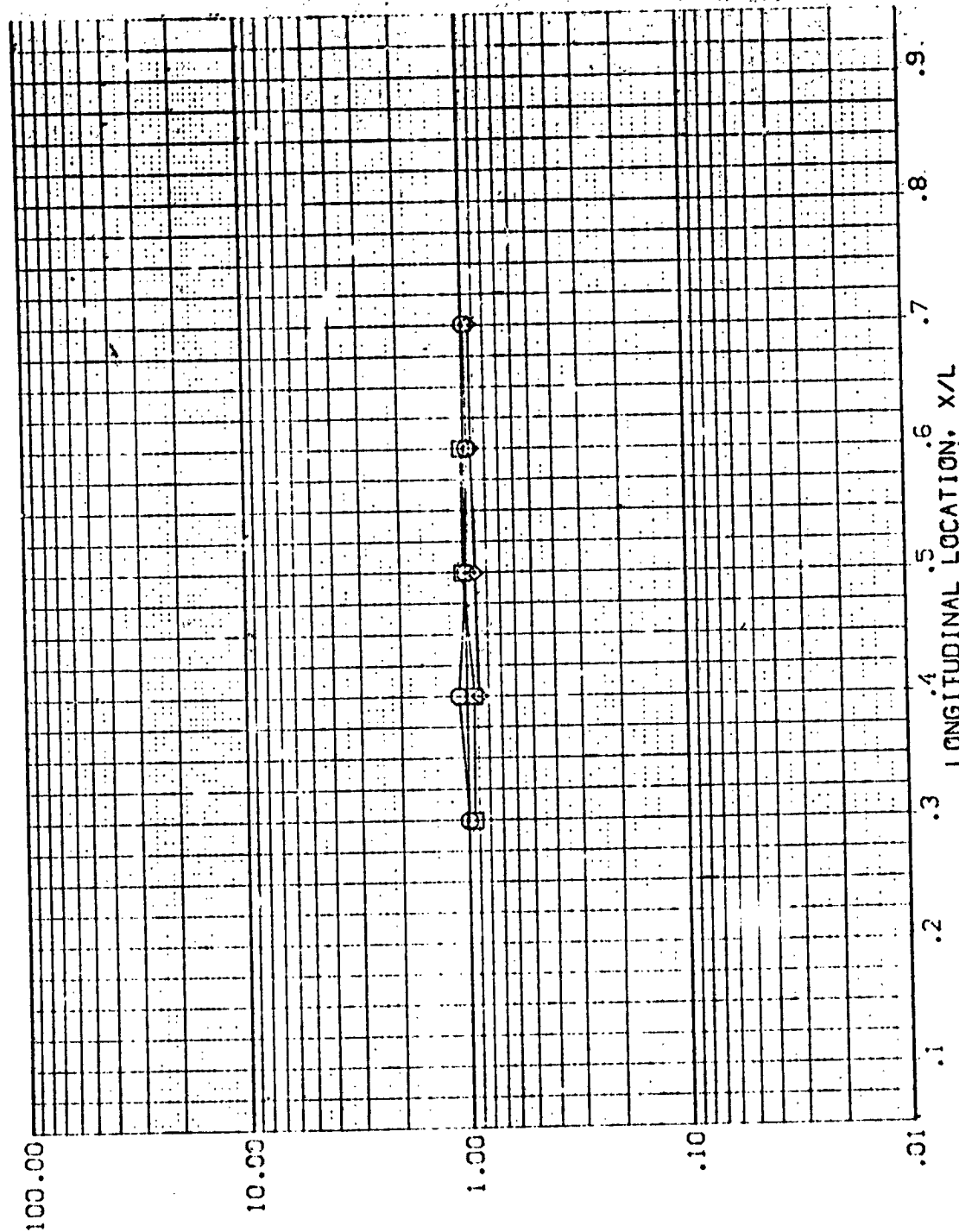


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

SYMBOL X/L HAW/HT MACH  
□ .300 .500 5.228  
◇ .400  
◇ .500  
◇ .600  
◇ .700

PARAMETRIC VALUES  
ALPHA/ RN/L .000 1.000  
BETA .300

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

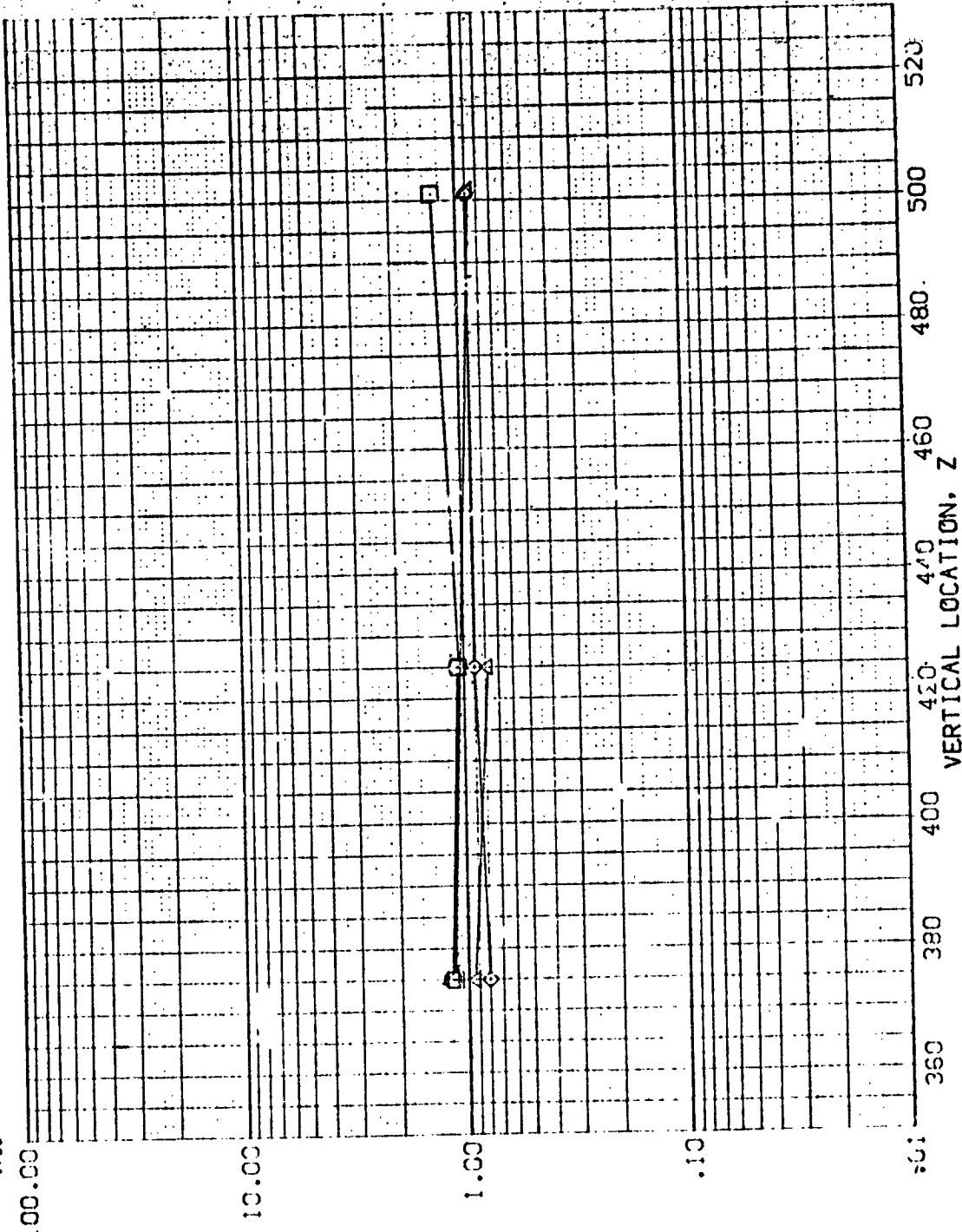


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(BEVB02)

PARAMETRIC VALUES  
ALPHA 30.000 BETA .000  
RN/L 1.000

SYMBOL X/L MAX/WT MACH  
.300 .400 .500 .600 .700 .900 5.219

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

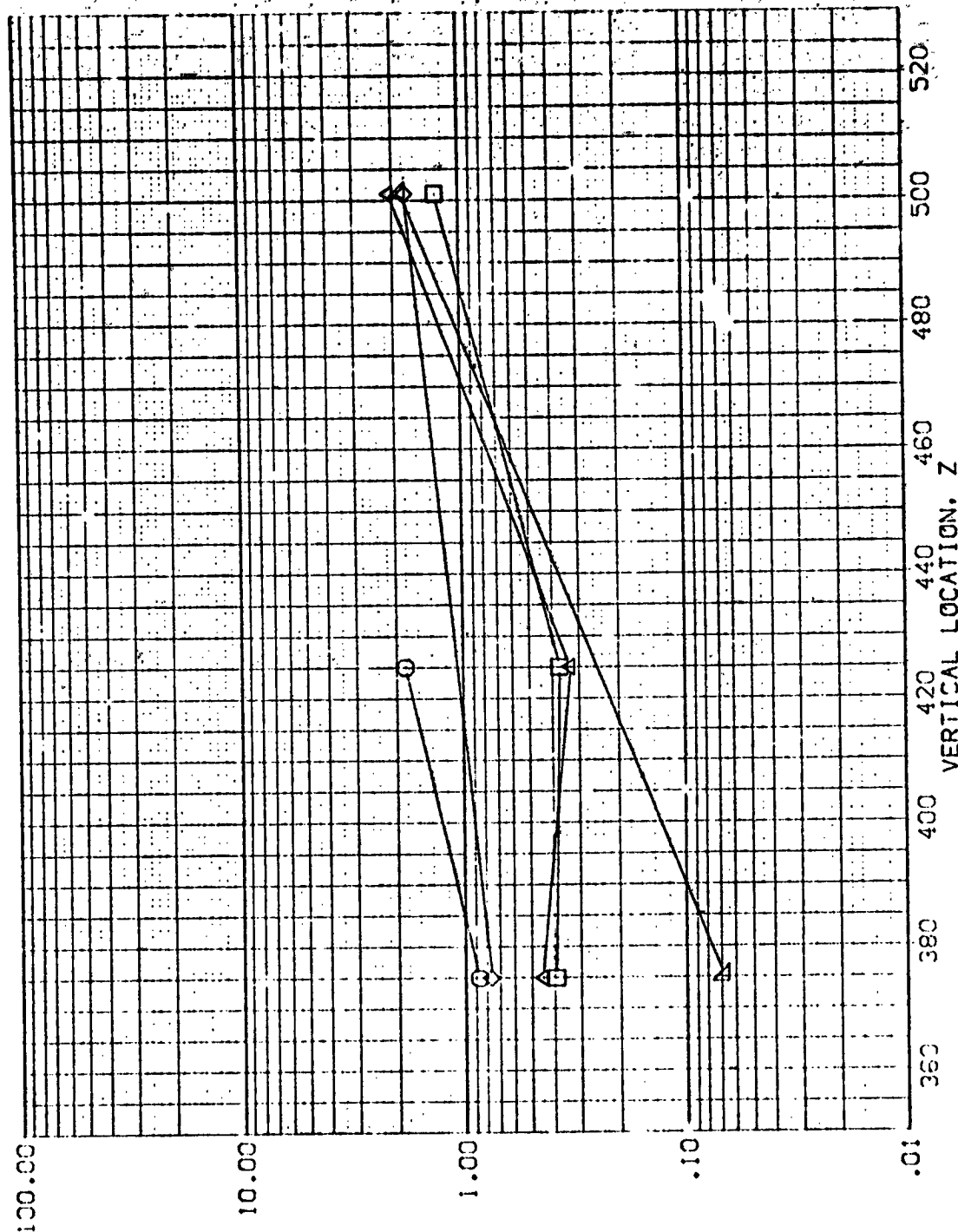


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED



(3EVB03)

AVES 3.5-195 IH28 01+T1 BODY SIDEWALL

SYNTH  
X/L  
.300  
.400  
.500  
.600  
.700

HA/HT  
.900  
MACH  
5.220

PARAMETRIC VALUES  
ED.000  
BETA  
1.000  
ALPHA  
RN/L  
.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

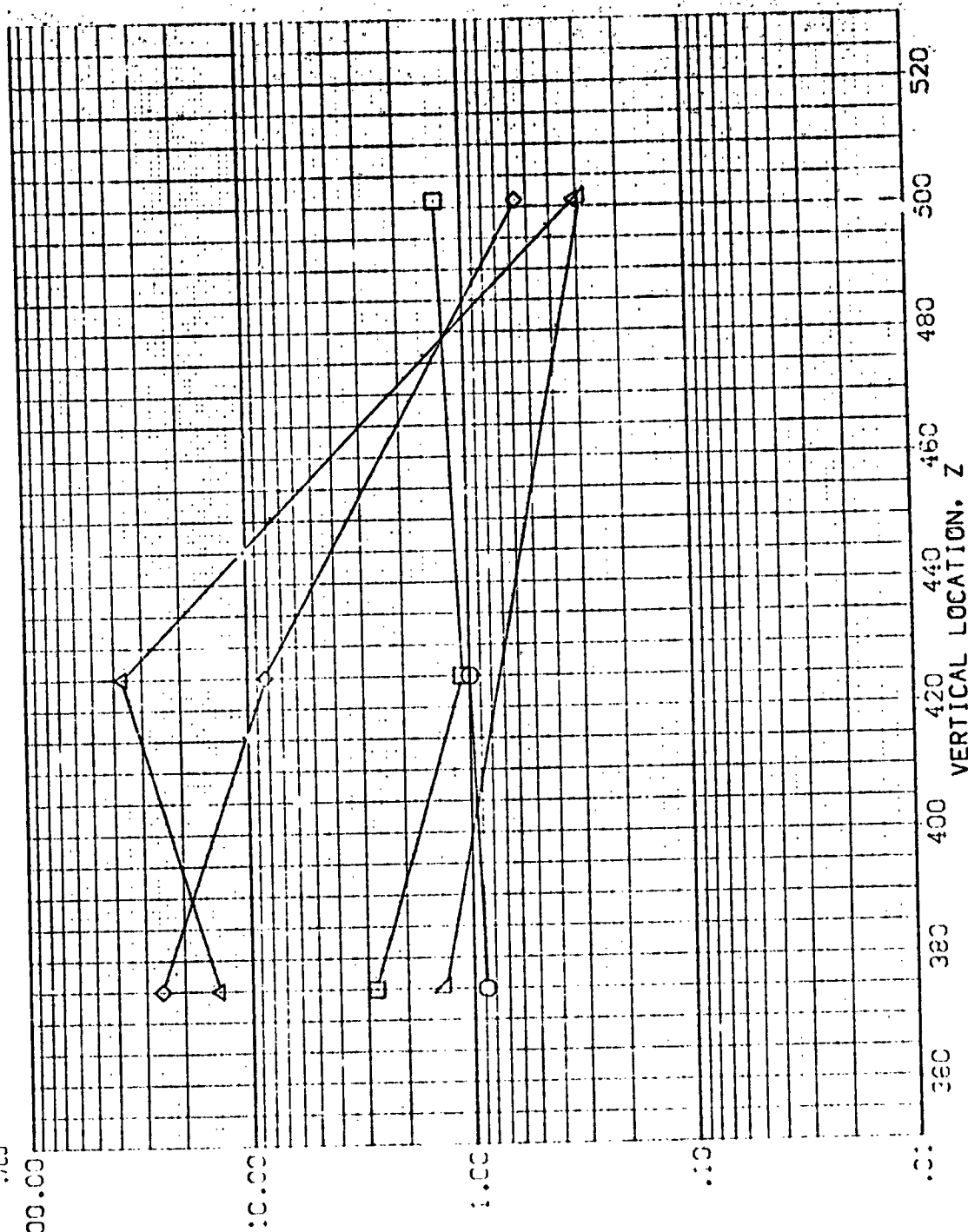


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 BODY SIDEWALL

(BEVB04)

SVSEC- X/L  
 .300  
 .400  
 .500  
 .600  
 .700

HAW/WT MACH  
 .900 5.219

PARAMETRIC VALUES  
 ALPHA 90.000 BETA .000  
 RN/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H_i/H_u$

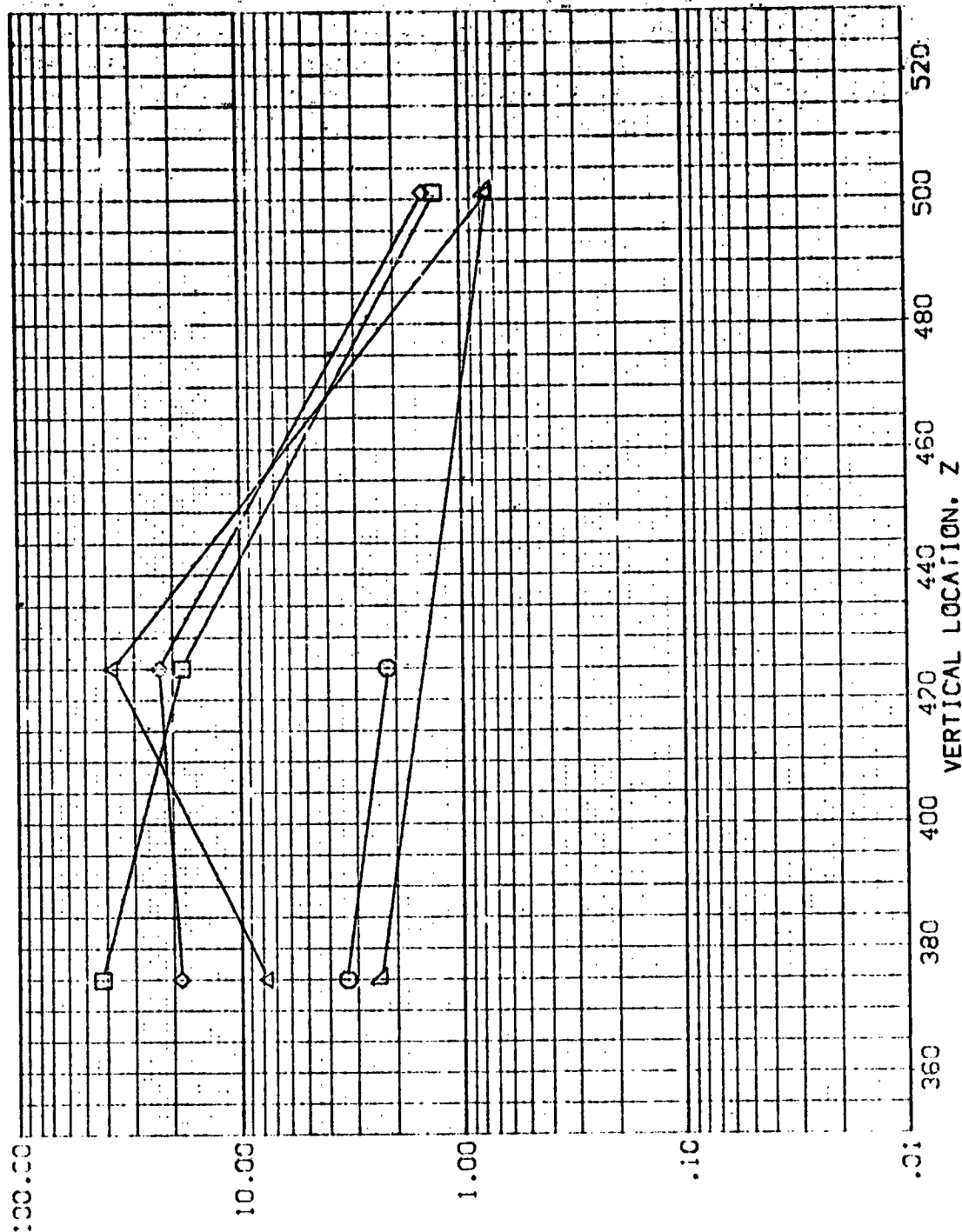


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED...

(BEVB05)

AMES 3.5-:95 IH28 01+T1 BODY SIDEWALL

PARAMETRIC VALUES  
ALPHA 120.000  
BETA 1.000

PNVL

HI/HI MACH  
.900 5.220

SYMBOL X/L  
.300  
.400  
.500  
.600  
.700

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

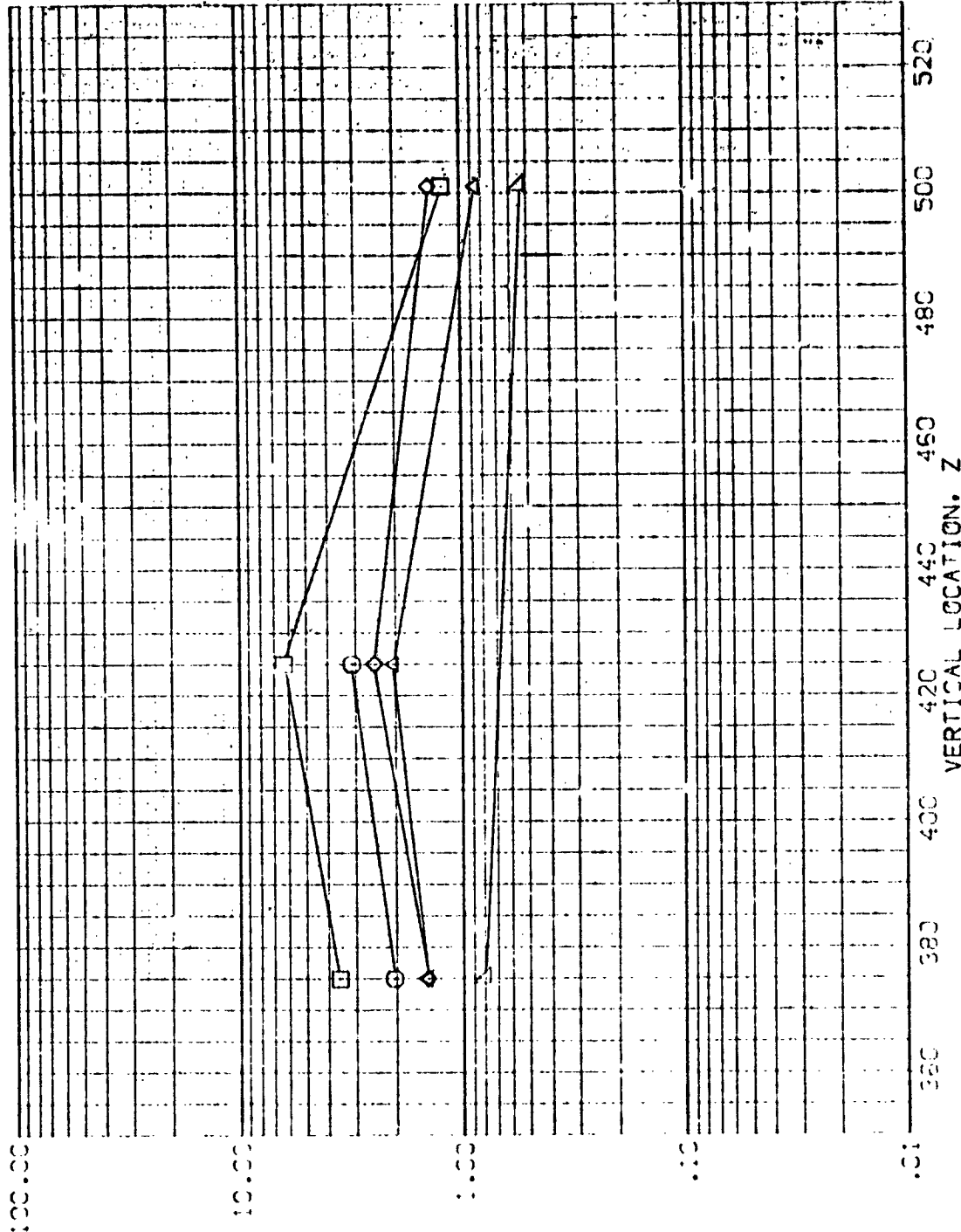


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 1:428 01:11 BODY SIDEWALL

(BEV806)

$\frac{h}{h_\infty}$  1.00  
 $\frac{h}{h_\infty}$  .900  
 $\frac{h}{h_\infty}$  .800  
 $\frac{h}{h_\infty}$  .700  
 $\frac{h}{h_\infty}$  .600  
 $\frac{h}{h_\infty}$  .500  
 $\frac{h}{h_\infty}$  .400  
 $\frac{h}{h_\infty}$  .300  
 $\frac{h}{h_\infty}$  .200  
 $\frac{h}{h_\infty}$  .100  
 $\frac{h}{h_\infty}$  .01

PARAMETRIC VALUES  
 ALPHA -120.000 BETA .000  
 $R_1/L$  1.000

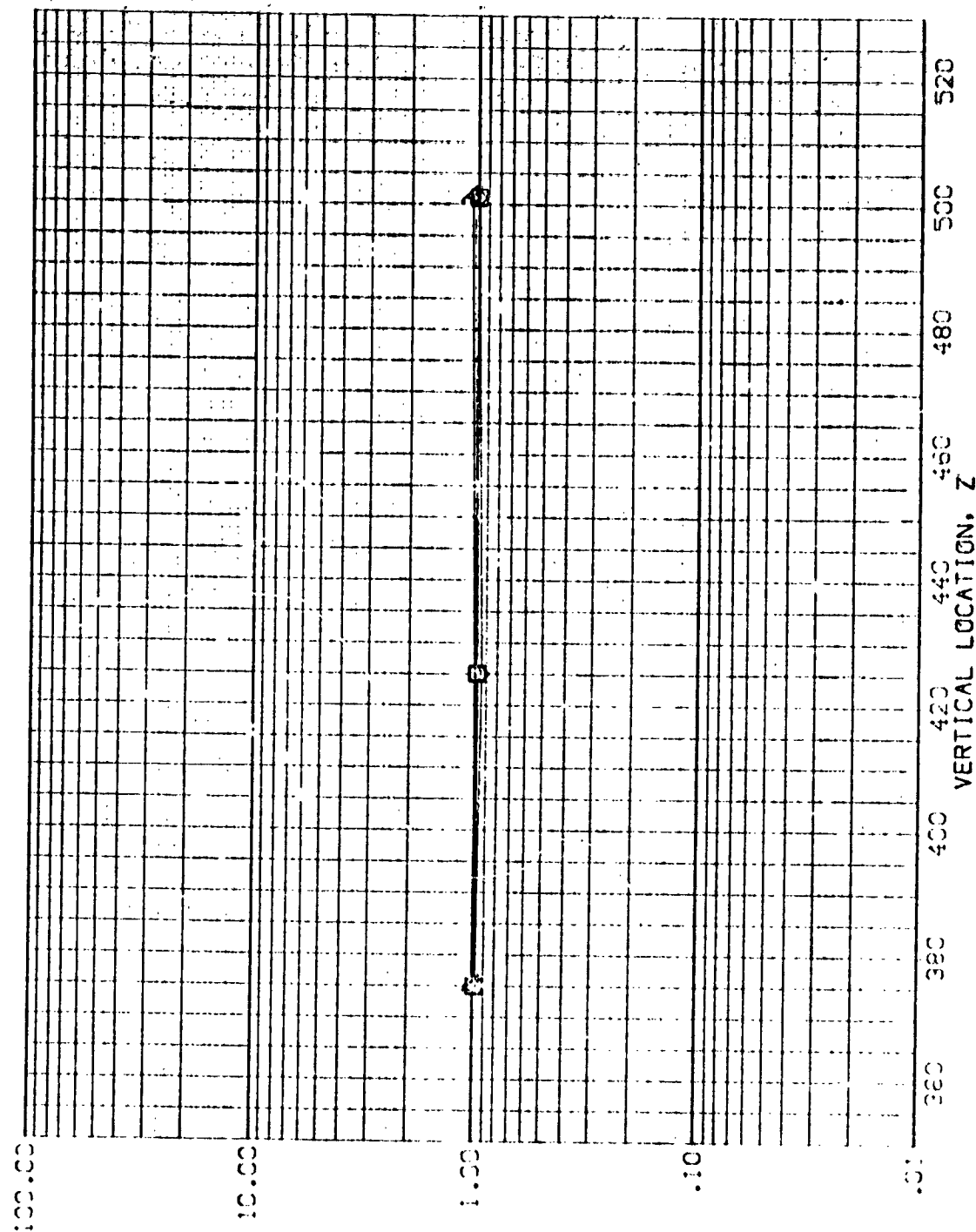


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AVES 3.5-195 IF28 01+T: BODY SIDEWALL

(3EY3C7)

1.4070  
S.W.E.C. X/L  
.300  
.400  
.500  
.600  
.700

REFLECT .900 MACH 5.219

PARAMETER VALUES  
-80.000 BEY  
1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

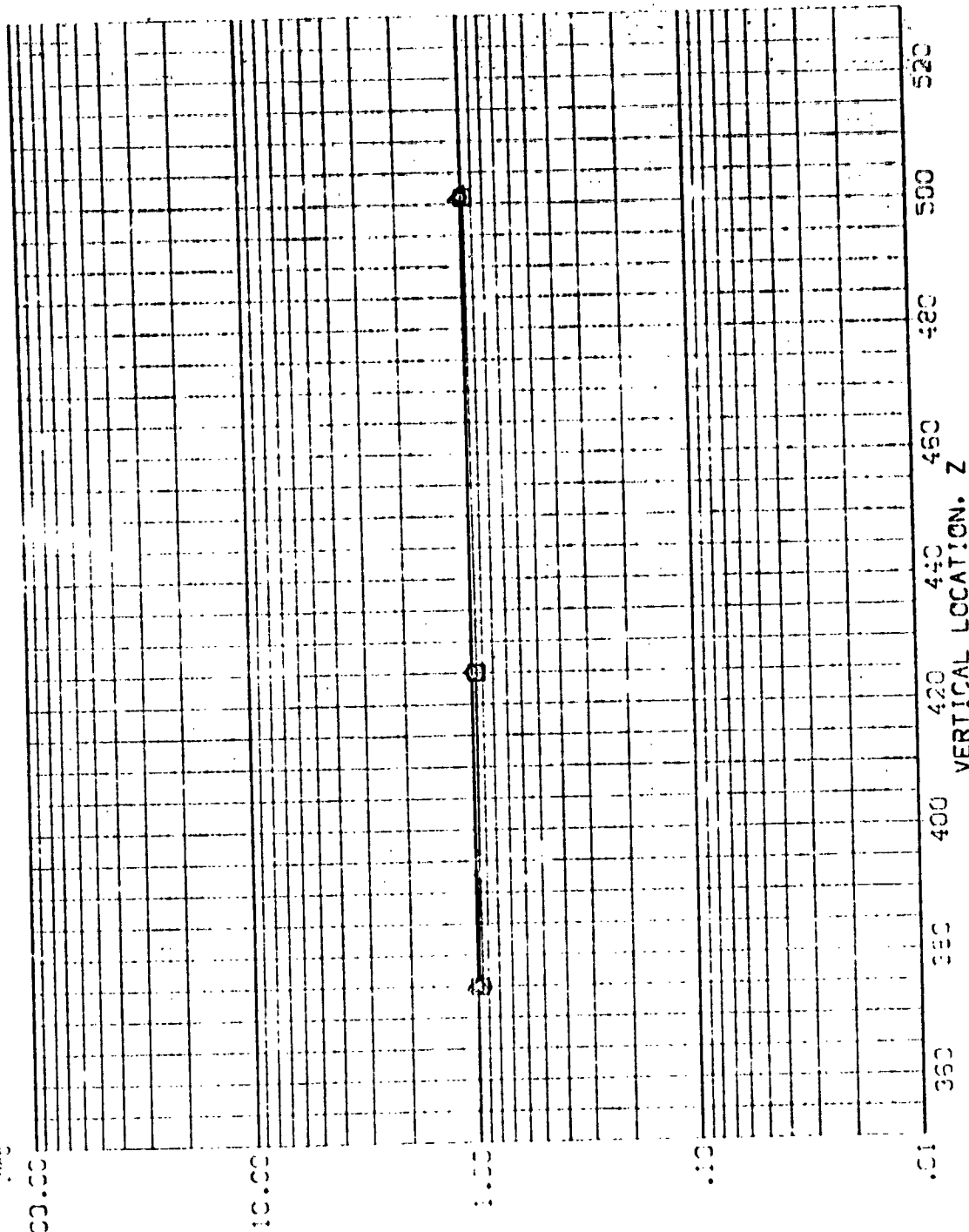


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 1-28 01+71 BODY SIDEWALL

(BEV308)

PARAMETRIC VALUES  
ALPHA -60.000 BETA .000  
PR/L 1.000

WALL X/L VACH  
.300 .900 5.220  
.400  
.500  
.600  
.700

PROF

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

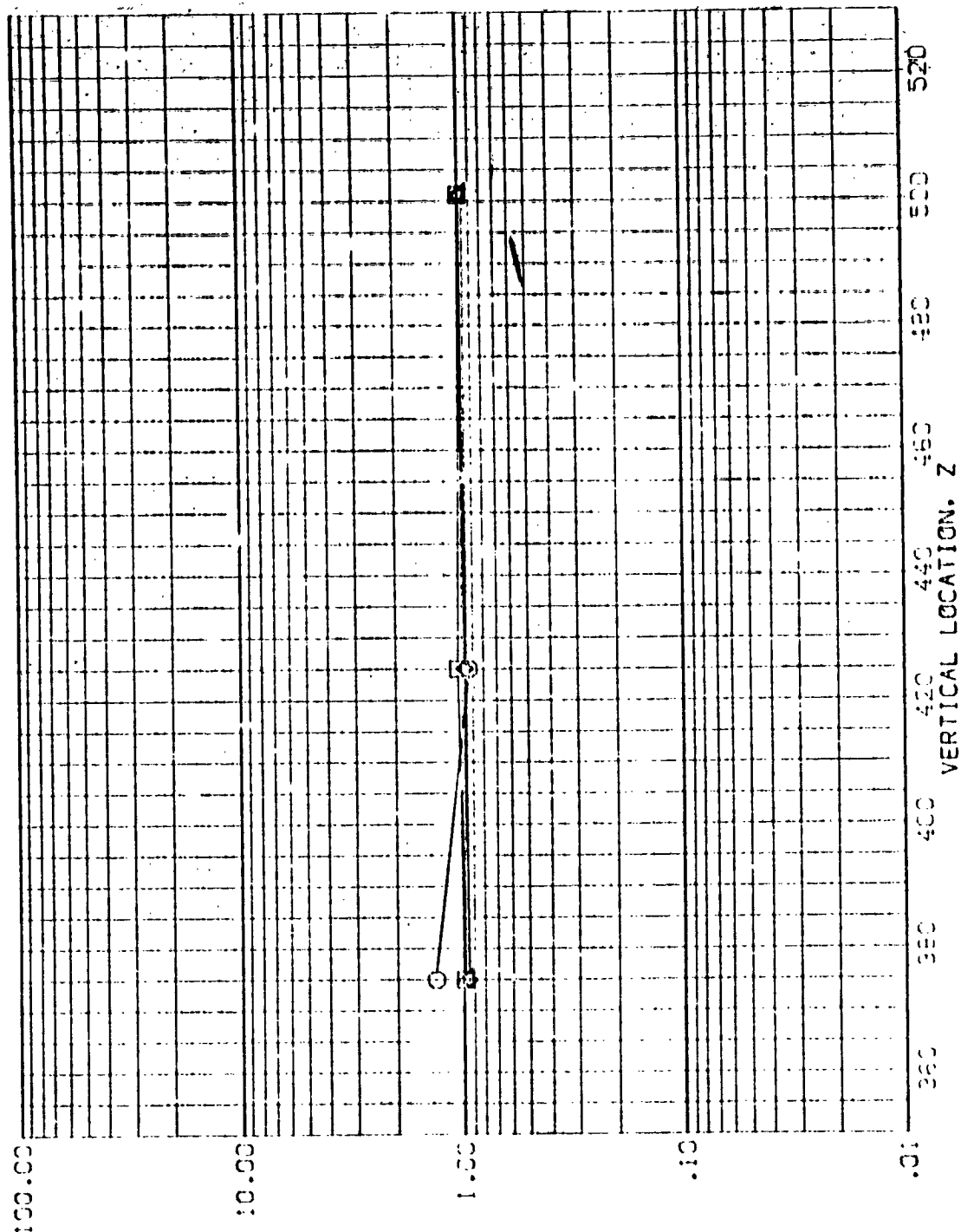


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

(BEV889)

AMES 3.5-195 1H28 01+T1 BODY SIDEWALL

SWEEP X/L H/W/HT MACH  
.300  
.400  
.500  
.600  
.700 5.220

PARAMETRIC VALUES  
ALPHA -30.000 BETA .000  
RN/L 1.000

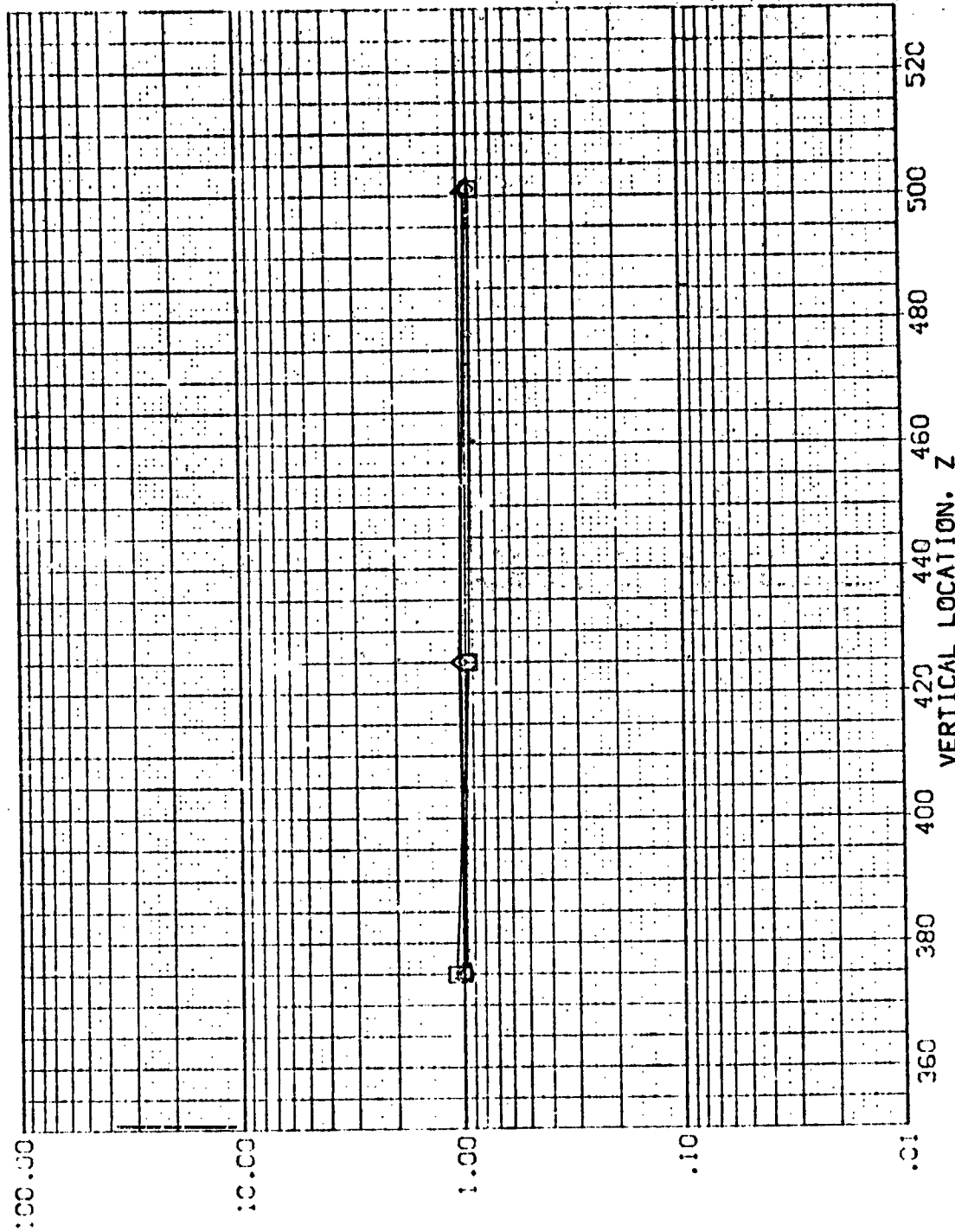
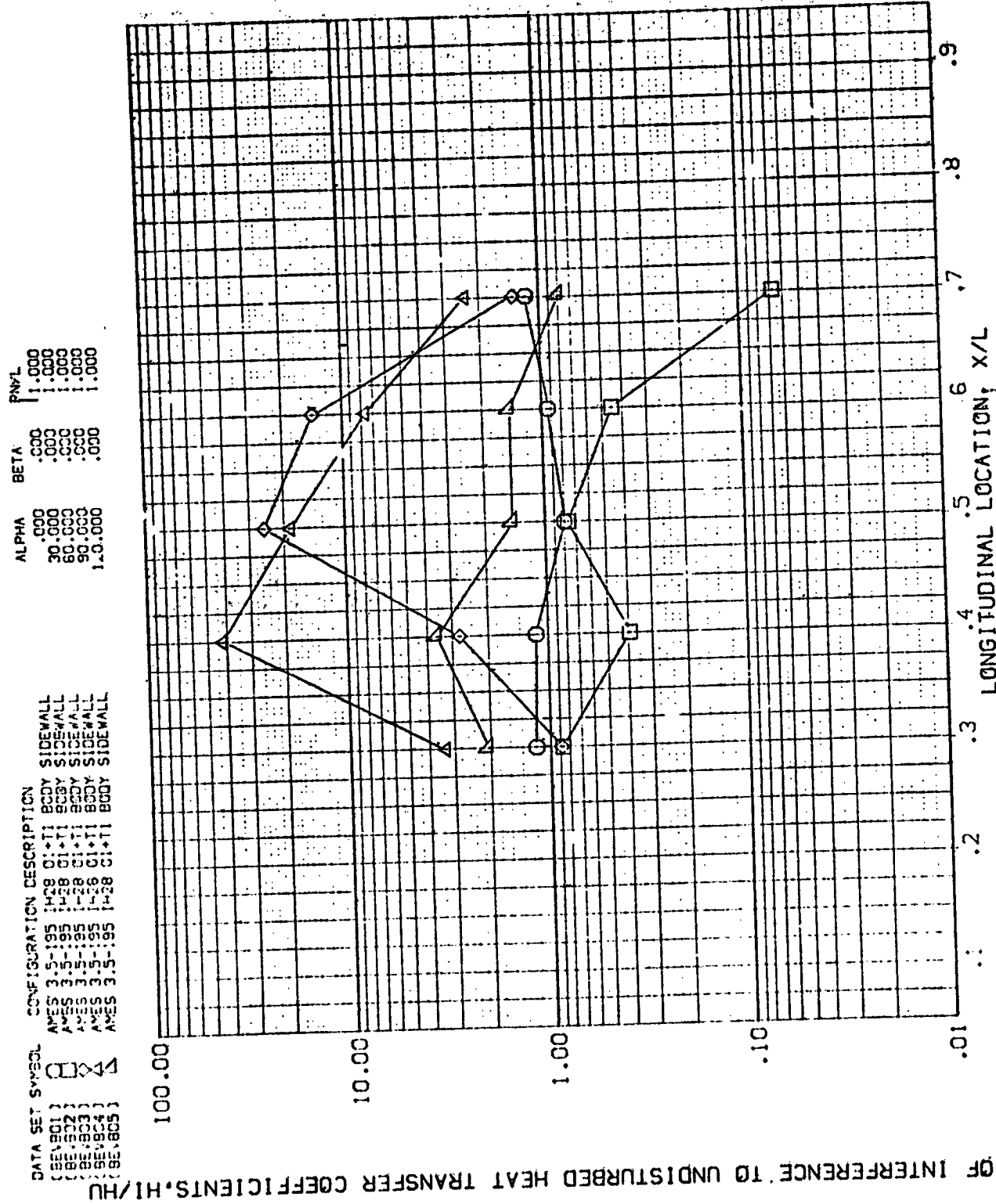


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

FIG. 12 CPBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

ACH = 5.300 HAW/HT = .900 Z = 375.000



DATA SET SYM-  
 (BE) 3.5-1.95 1428 01+11 BODY SIDEWALL  
 (BE) 3.5-1.95 1428 01+11 BODY SIDEWALL  
 (BE) 3.5-1.95 1428 01+11 BODY SIDEWALL  
 (BE) 3.5-1.95 1428 01+11 BODY SIDEWALL  
 (BE) 3.5-1.95 1428 01+11 BODY SIDEWALL

ALPHA BETA RMV  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

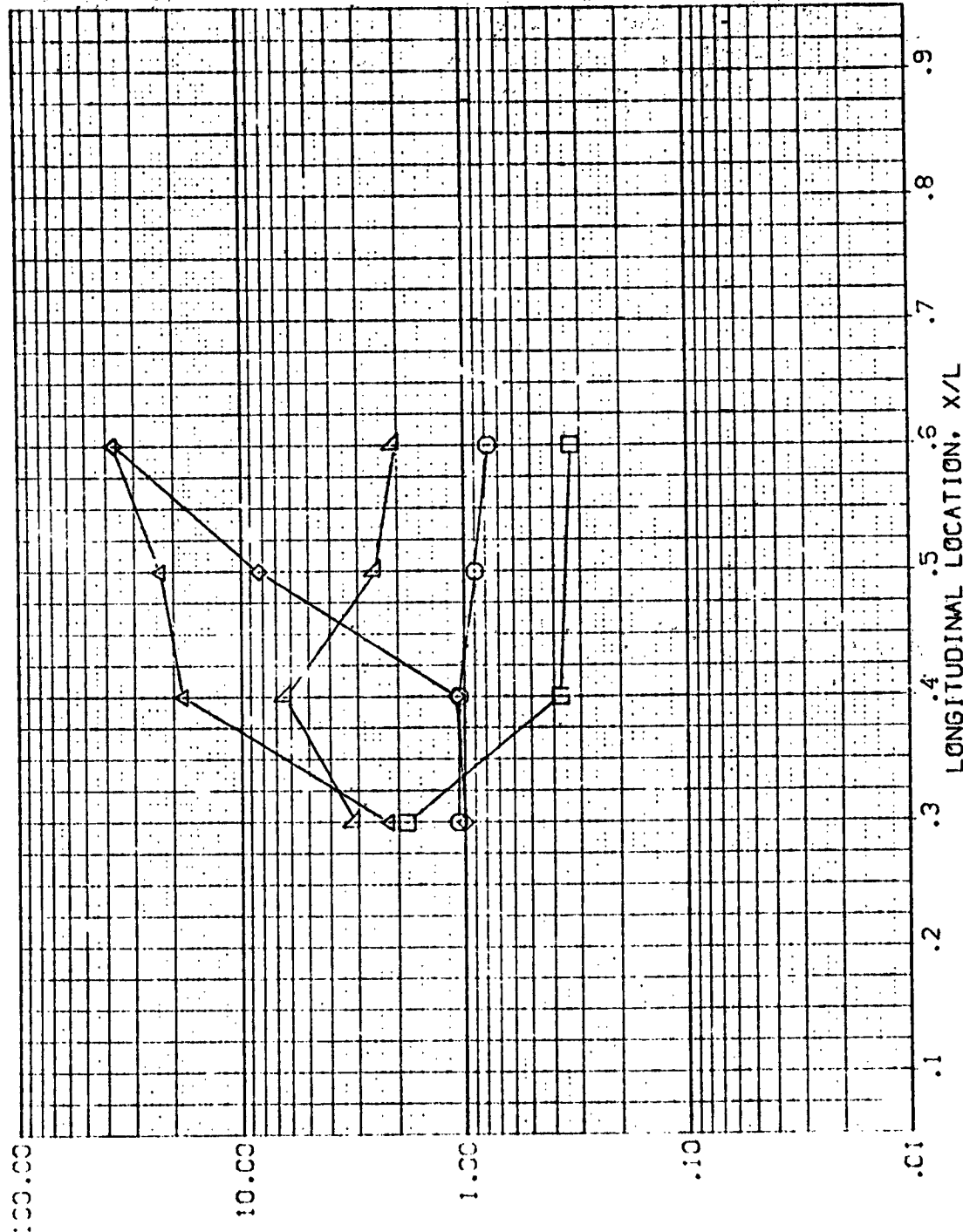


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

DATA SET ORBITAL CONFIGURATION DESCRIPTION  
 (25.000) AMES 3.5-195 H28 CI+TI BODY SIDEWALL  
 (25.000) AMES 3.5-195 H28 CI+TI BODY SIDEWALL  
 (25.000) AMES 3.5-195 H28 CI+TI BODY SIDEWALL  
 (25.000) AMES 3.5-195 H28 CI+TI BODY SIDEWALL  
 (25.000) AMES 3.5-195 H28 CI+TI BODY SIDEWALL

ALPHA BETA RN/L  
 1.000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

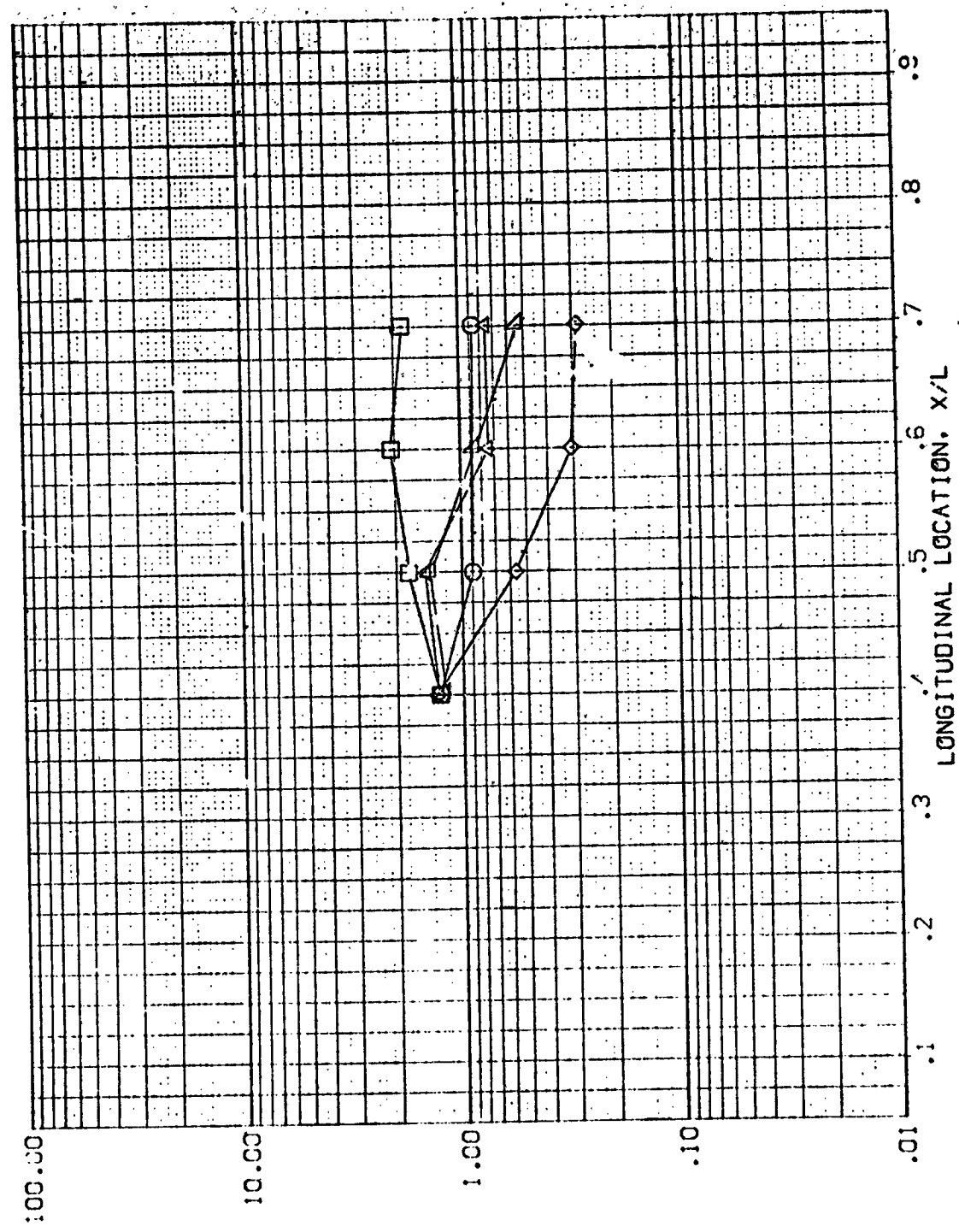


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

ALPHA	BETA	PW/L
.000	.000	1.000
-30.000	.000	1.000
-60.000	.000	1.000
-90.000	.000	1.000
-120.000	.000	1.000

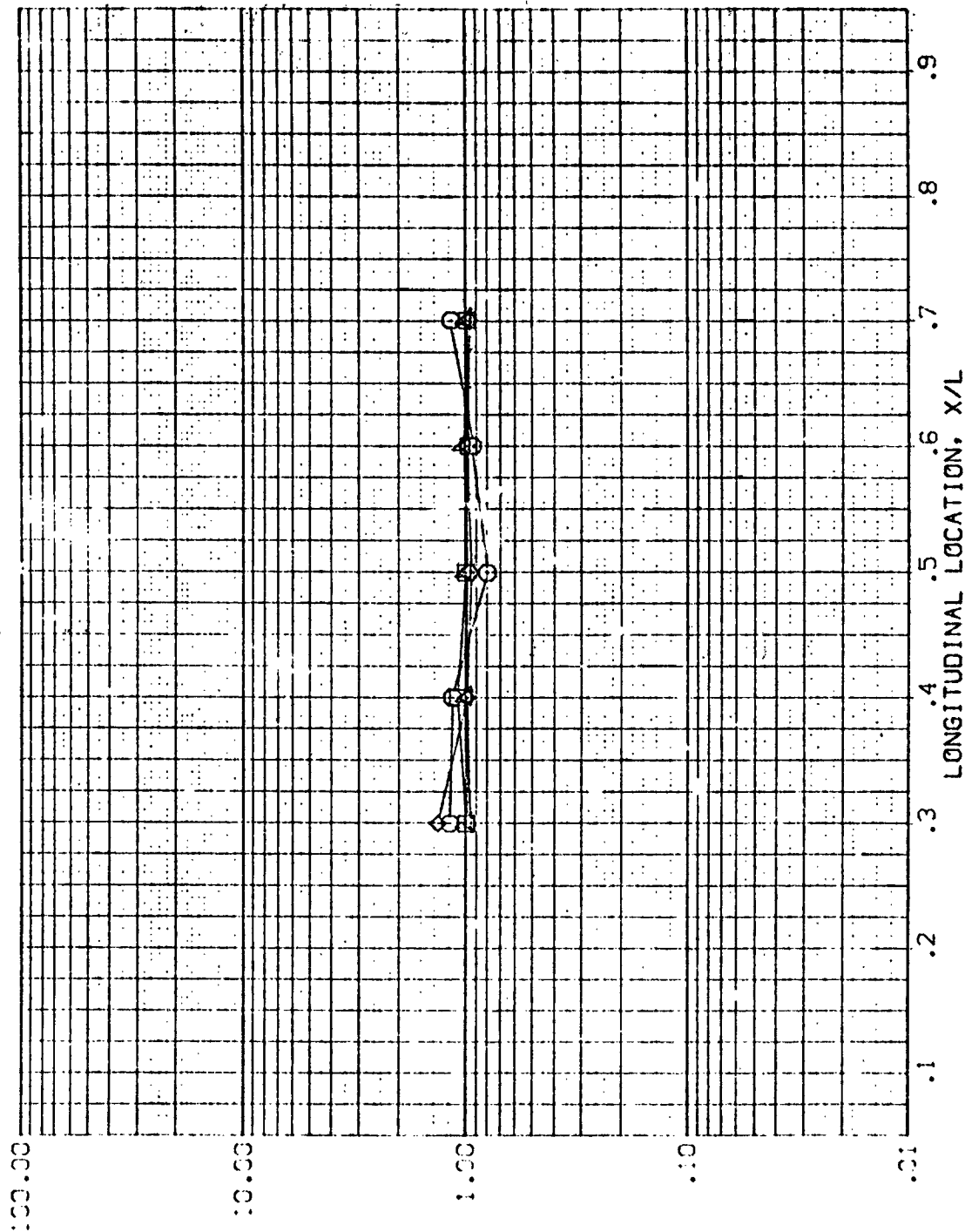


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

$$15.33 \times 10^3 \text{ W/HT} = 375.000 \text{ Z}$$
RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

DATA SET SYMBOLS  
 (SEV501)  
 (SEV502)  
 (SEV503)  
 (SEV504)  
 (SEV505)

CONFIGURATION DESCRIPTION  
 ASES 3.5-195 1428 01+11 BODY SIDE-ALL  
 ASES 3.5-195 1428 01+11 BODY SIDEWALL  
 ASES 3.5-195 1428 01+11 BODY SIDEWALL  
 ASES 3.5-195 1428 01+11 BODY SIDEWALL  
 ASES 3.5-195 1428 01+11 BODY SIDEWALL

ALPHA BETA RM/L  
 .000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

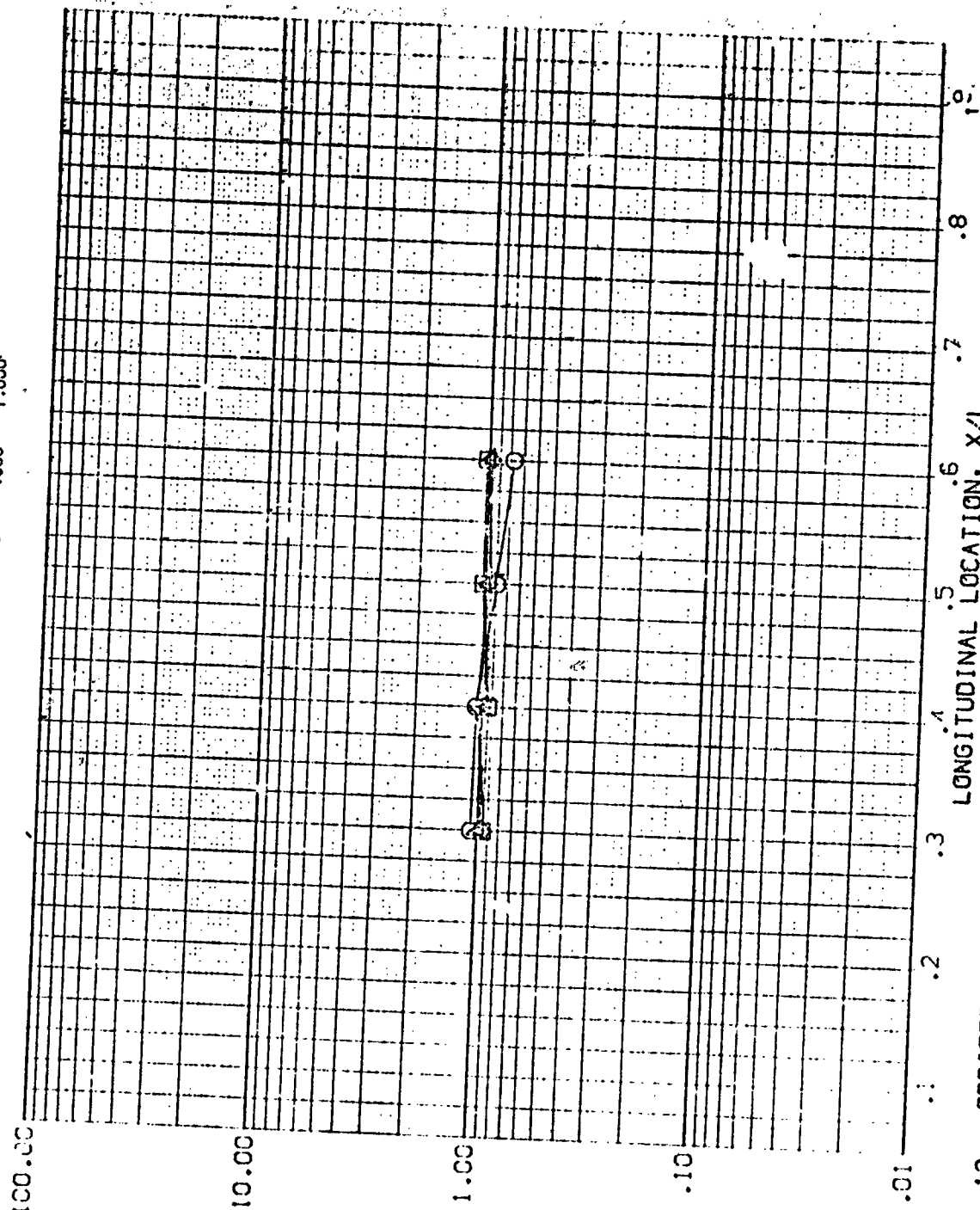
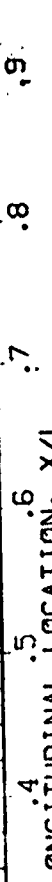


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

MA-CH = 5.500 HAW/HT = .900 Z = 425.000

DATA SET SYSCAT



000

PAGE

$$100 = 5.366 - \frac{1}{2} \ln \frac{1}{100} = 5.366 + 0.921 = 6.287$$

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

ALPHA	BETA	RV/L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(35)BC1	3.5 1.35 1.38 01+11 BODY SIDEWALL
(35)BC2	3.5 1.35 1.38 01+11 BODY SIDEWALL
(35)BC3	3.5 1.35 1.38 01+11 BODY SIDEWALL
(35)BC4	3.5 1.35 1.38 01+11 BODY SIDEWALL
(35)BC5	3.5 1.35 1.38 01+11 BODY SIDEWALL

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

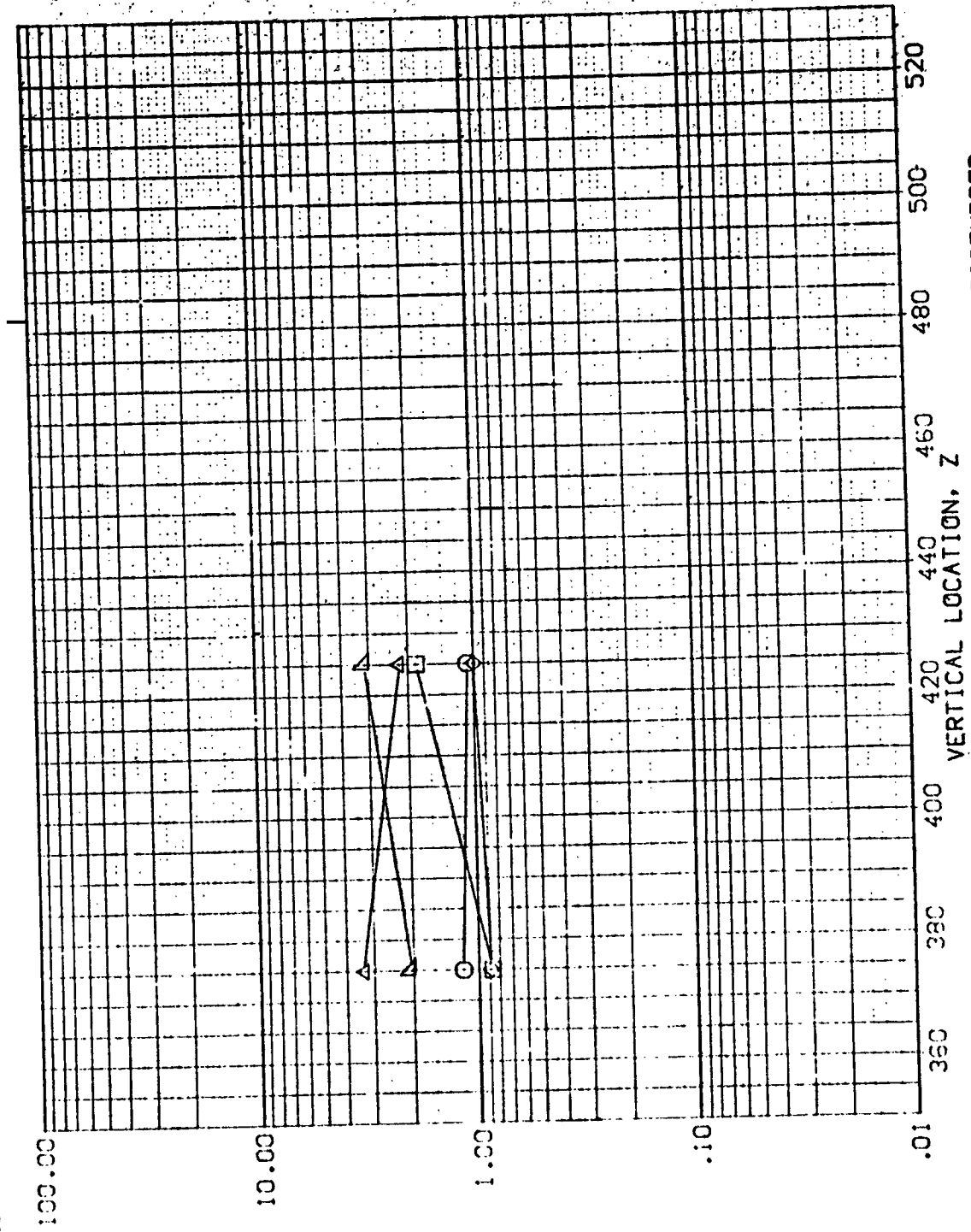


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED



DATA SET SYMBOL CONFIGURATION DESCRIPTION ALPHA BETA PN/L

AVES 3 5-195	1-28	CI+TI	BODY	1.000	1.000
AVES 3 5-195	1-28	CI+TI	SIDEWALL	1.000	1.000
AVES 3 5-195	1-28	CI+TI	BODY	1.000	1.000
AVES 3 5-195	1-28	CI+TI	SIDEWALL	1.000	1.000
AVES 3 5-195	1-28	CI+TI	BODY	1.000	1.000
AVES 3 5-195	1-28	CI+TI	SIDEWALL	1.000	1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

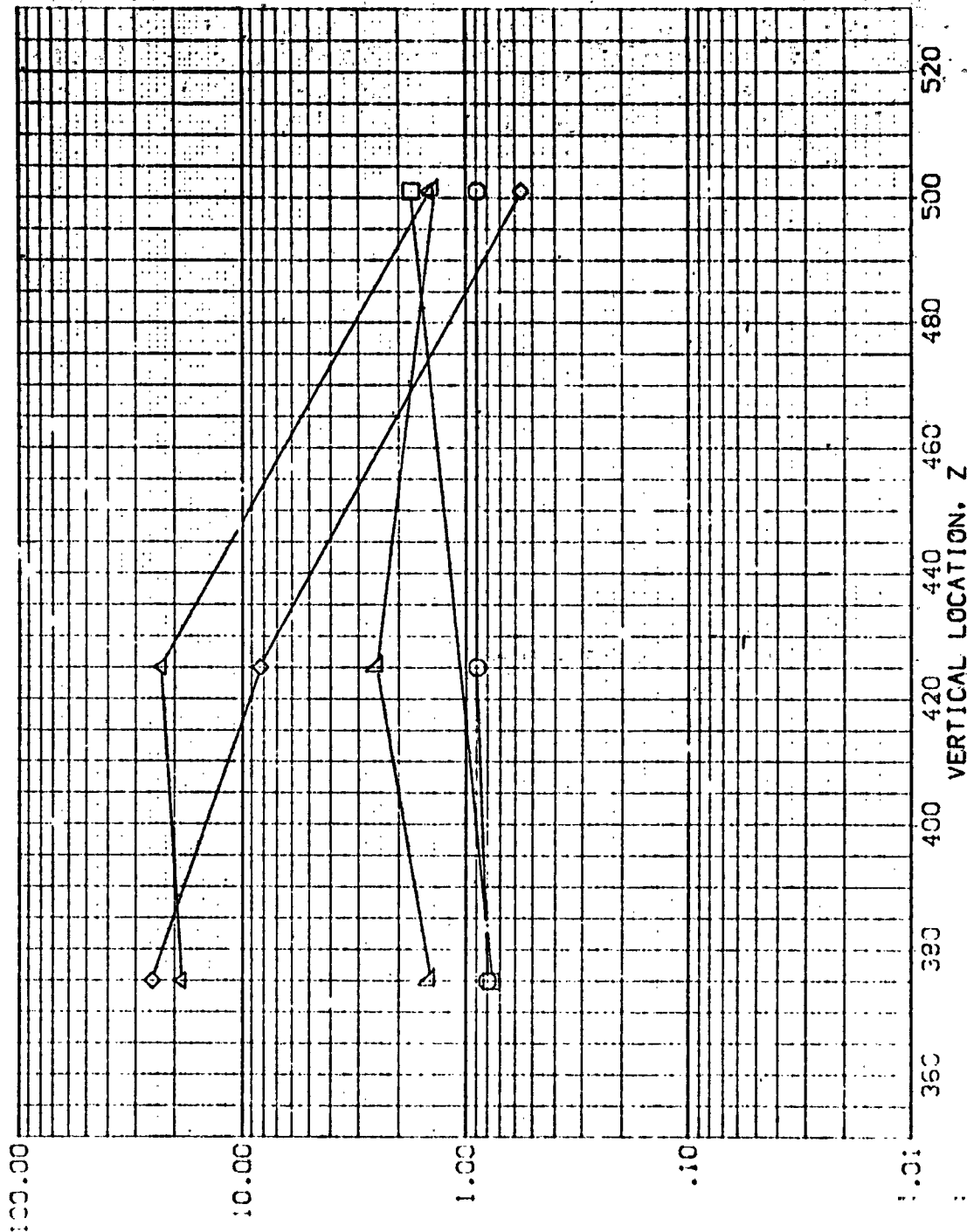
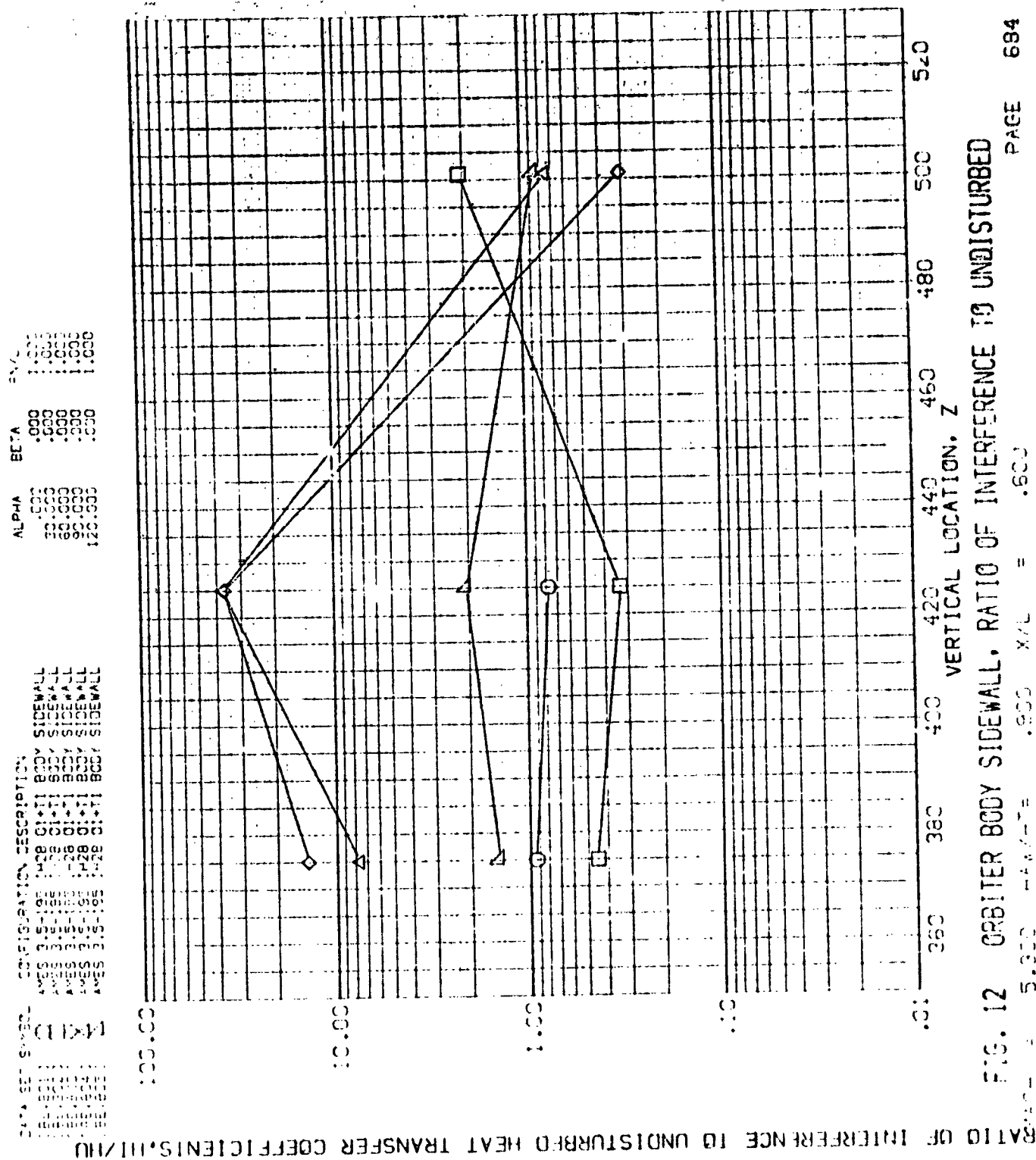
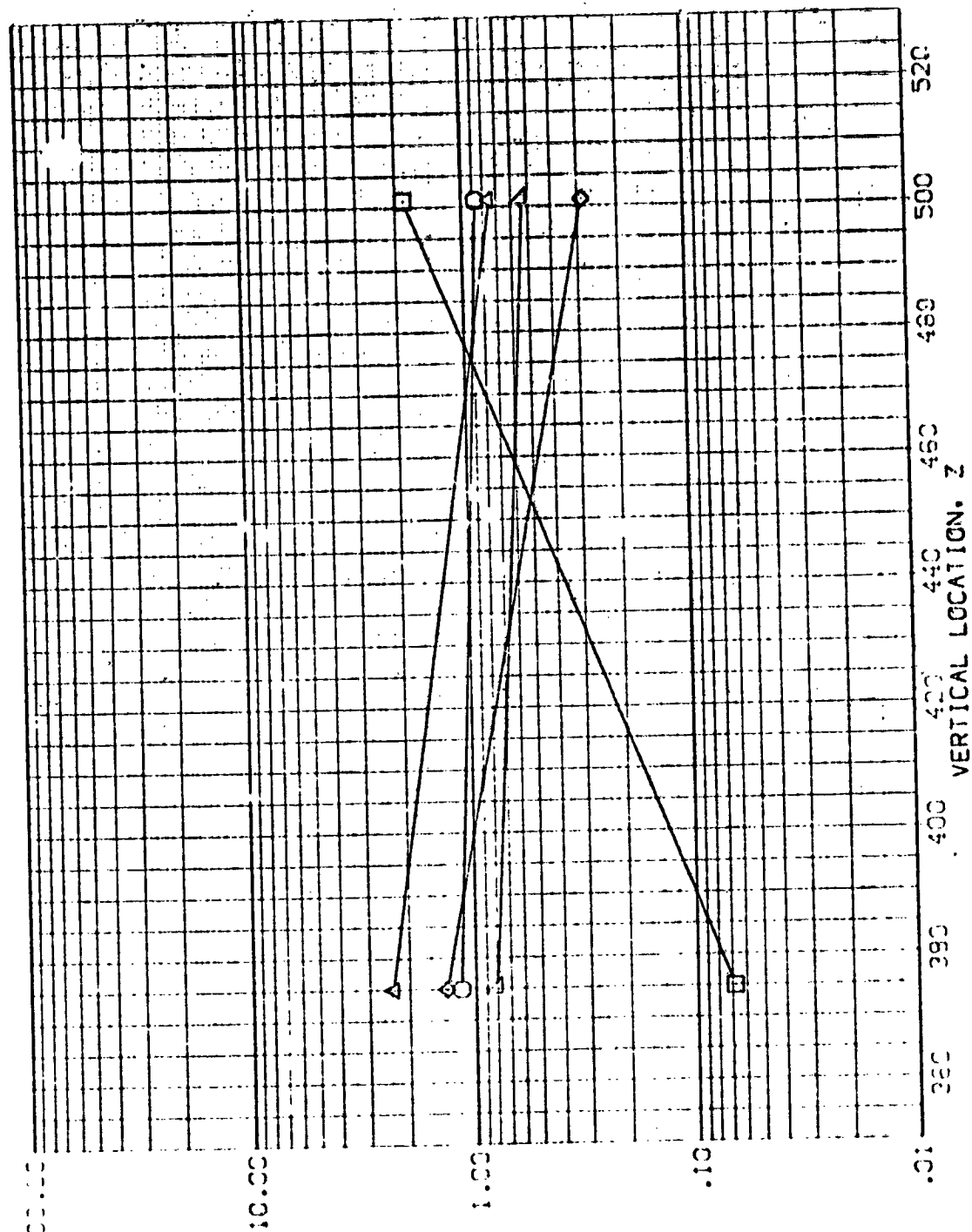


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED





[illegible]

VERTICAL LOCATION

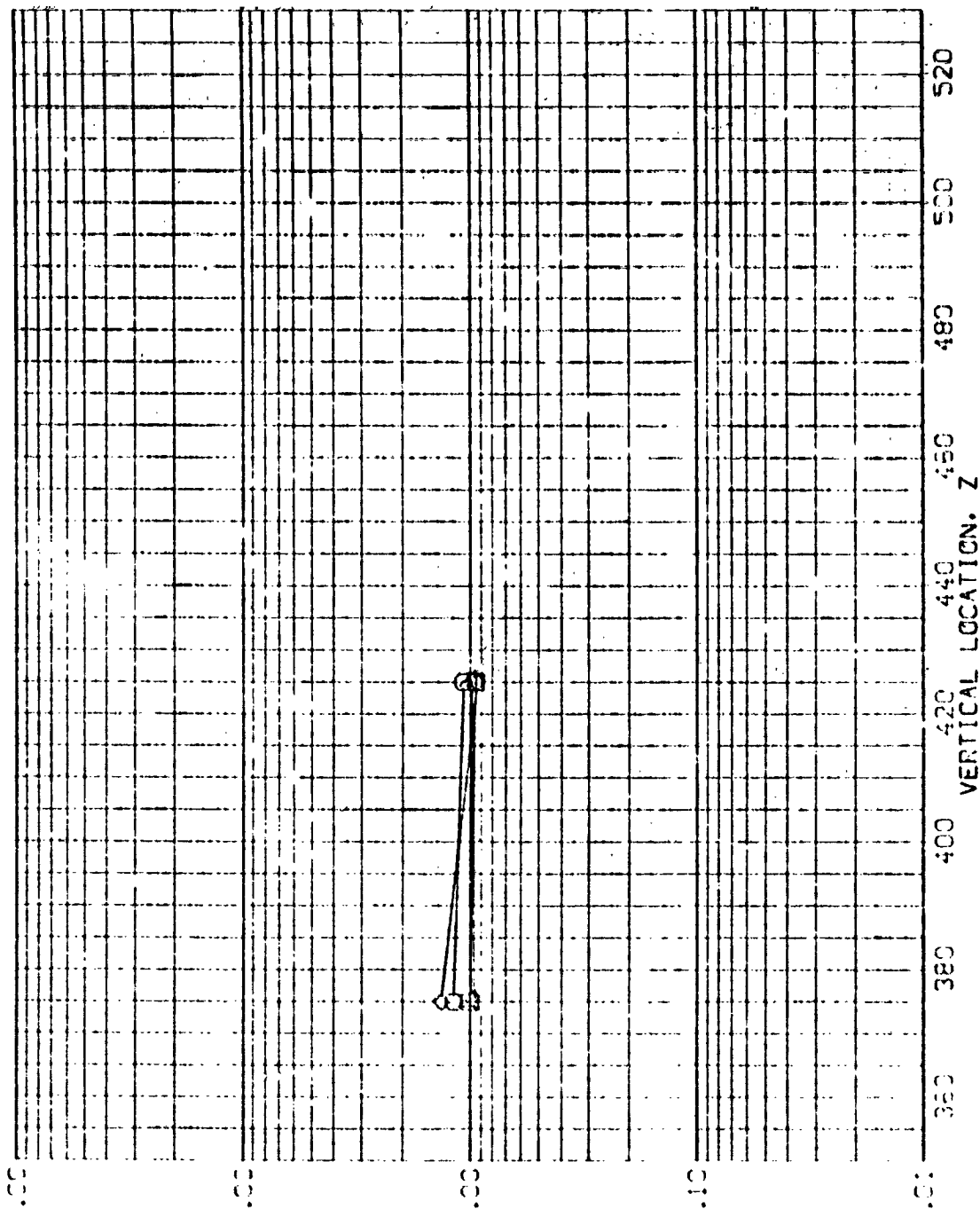
[illegible]

FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

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ALPHA	BETA	P.V/L
0.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

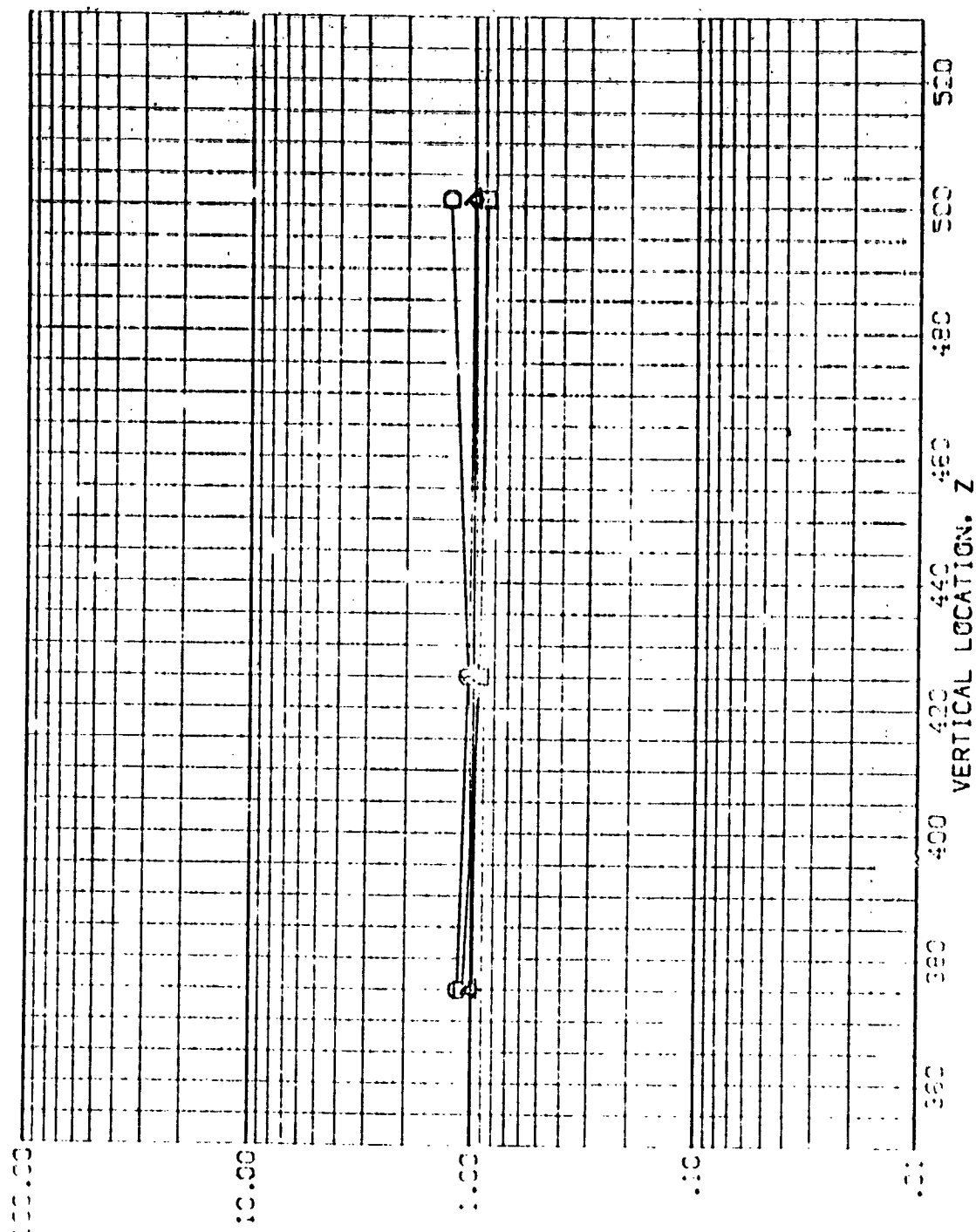


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

DATA SET SYM-2  
 (0000000)  
 (0000000)  
 (0000000)  
 (0000000)  
 (0000000)  
 (0000000)

CONFIGURATION DESCRIPTION  
 0000 3.5 1.95 1.48 01+11 BODY SIDEWALL  
 0001 3.5 1.95 1.48 01+11 BODY SIDEWALL  
 0002 3.5 1.95 1.48 01+11 BODY SIDEWALL  
 0003 3.5 1.95 1.48 01+11 BODY SIDEWALL  
 0004 3.5 1.95 1.48 01+11 BODY SIDEWALL  
 0005 3.5 1.95 1.48 01+11 BODY SIDEWALL

ALPHA BETA BETA  
 .000 .000 .000  
 -30.000 .000 .000  
 -30.000 .000 .000  
 -30.000 .000 .000  
 -30.000 .000 .000  
 -30.000 .000 .000

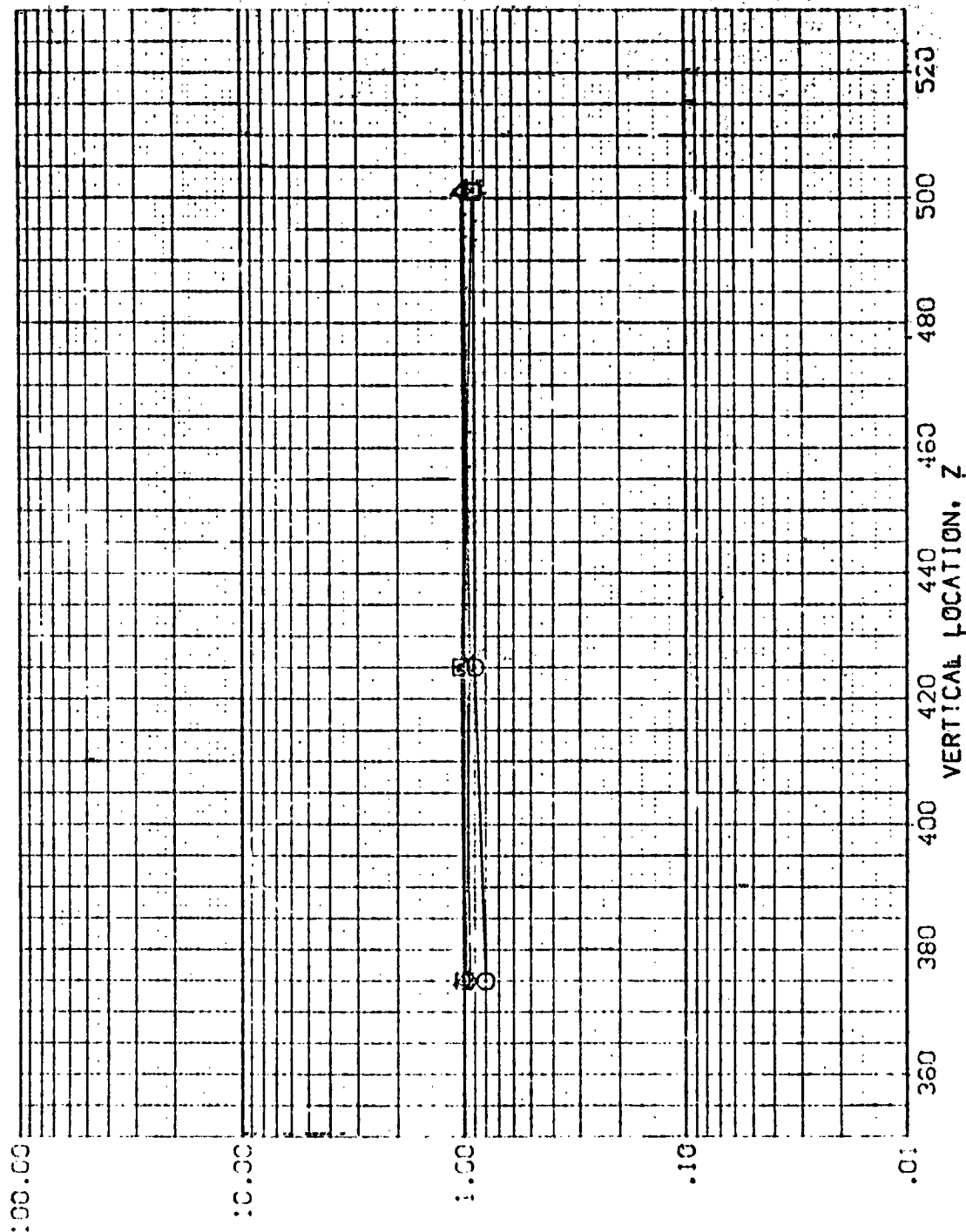


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

MACH = 5.300 HAW/HT = .900 X/L = .500 PAGE 688

REPRODUCTION OF THE  
 ORIGINAL PAGE IS

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (SEE 8011) X D AXES 3.5-195 1-28 01+11 BODY SIDEWALL  
 (SEE 802) X D AXES 3.5-195 1-28 01+11 BODY SIDEWALL  
 (SEE 803) X D AXES 3.5-195 1-28 01+11 BODY SIDEWALL  
 (SEE 804) X D AXES 3.5-195 1-28 01+11 BODY SIDEWALL  
 (SEE 805) X D AXES 3.5-195 1-28 01+11 BODY SIDEWALL

ALPHA BET R/V/L  
 .000 .000 11.000  
 -26.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

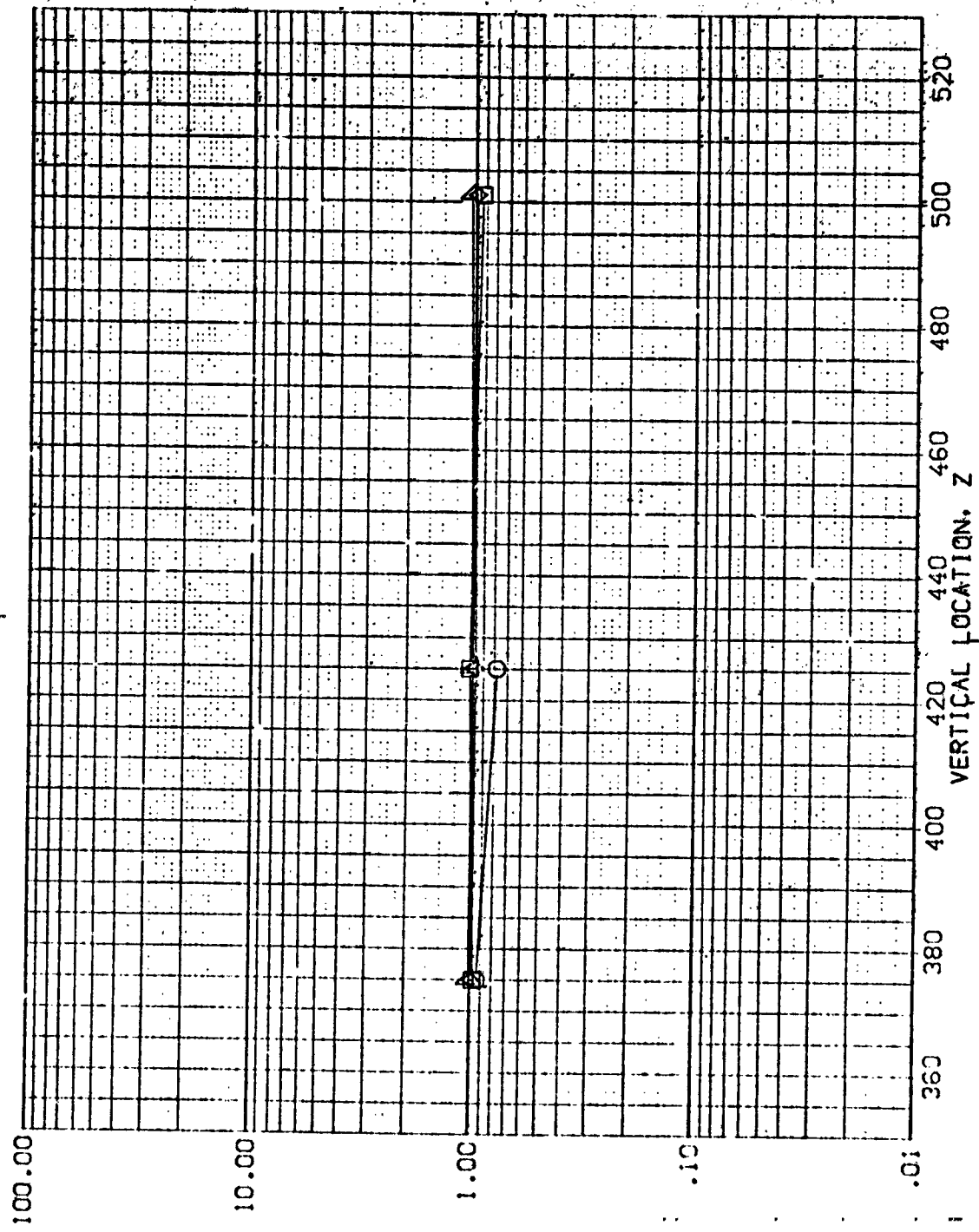


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 AMES 3.5-195 M28 CI+T1 BODY SIDE WALL  
 AMES 3.5-195 M28 CI+T1 BODY SIDE WALL  
 AMES 3.5-195 M28 CI+T1 BODY SIDE WALL  
 AMES 3.5-195 M28 CI+T1 BODY SIDE WALL  
 AMES 3.5-195 M28 CI+T1 BODY SIDE WALL

ALPHA BETA RV/L  
 .000 .000 1.000  
 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

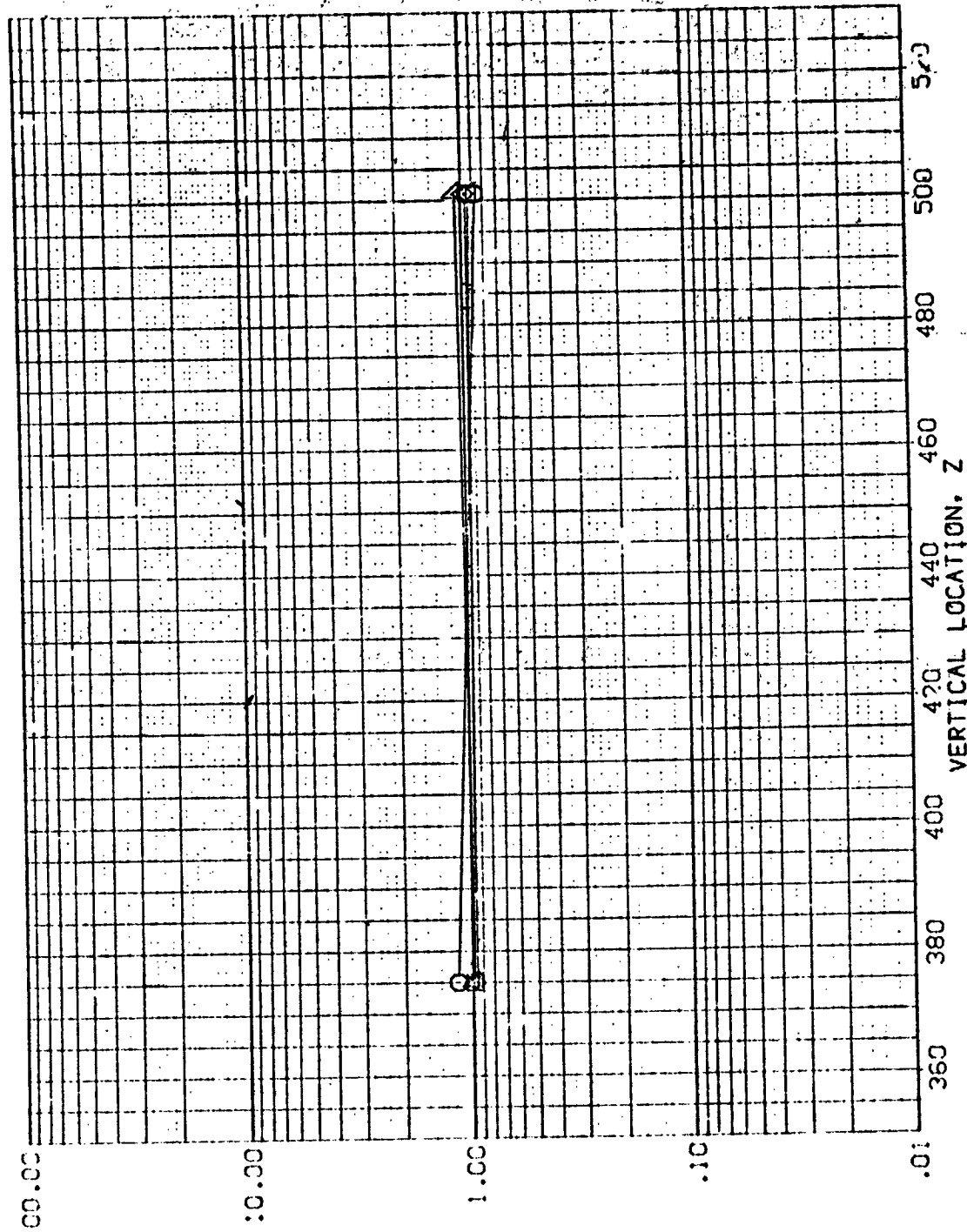


FIG. 12 ORBITER BODY SIDEWALL, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU  
 HAW/HT = 5.300 X/L = .900

AMES 3.5-195 1-28 01 CMS PODS (REVC19)

SYMBOL	HAW/HT	X/L	MACH	PARAMETRIC VALUES	
				ALPHA RN/L	BETA .000
◇	.850	.825	5.220	.000	.000
□	.900			1.000	
◇	1.000				

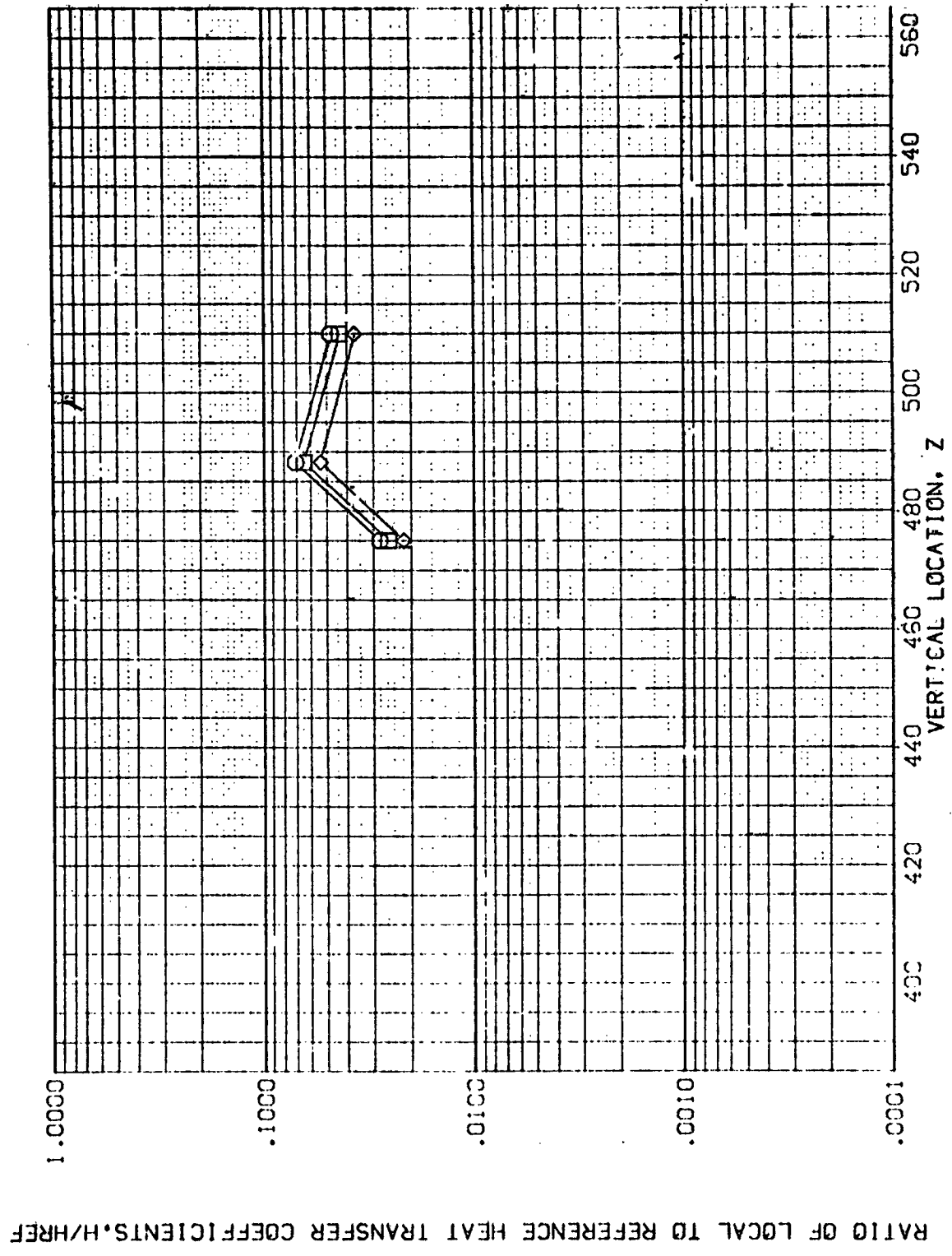


FIG. 13 CMS PODS, ORBITER ALONE



AMES 3.5-195 IH28 01 OMS PODS

(REVC19)

SYMBOL HA#-T X/L MACH  
 ◇ 110 .853 .900 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA .009 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

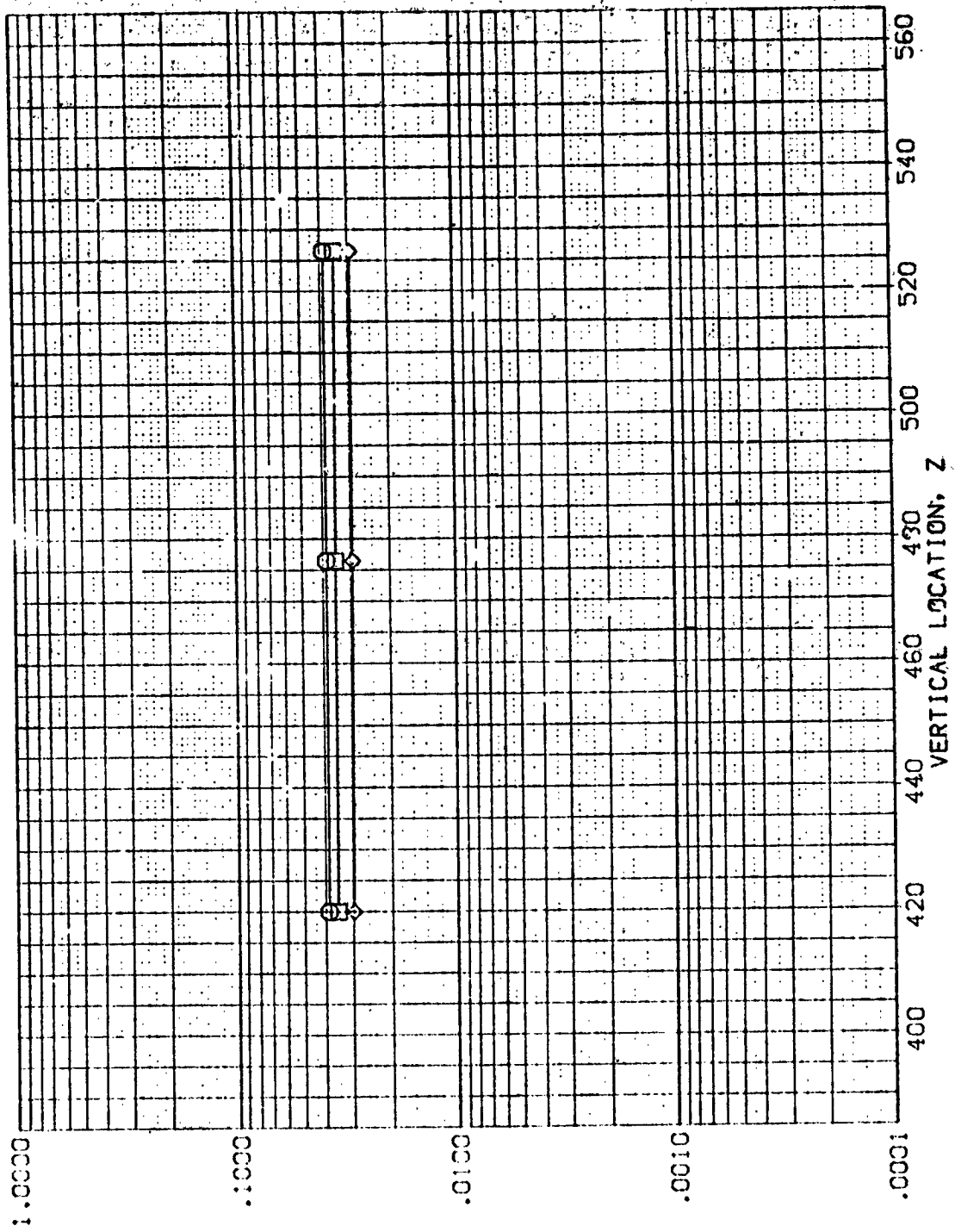


FIG. 13 OMS PODS, ORBITER ALONE

AMES 3.5-195 IH28 01 OMS PODS

(REVC20)

S-SEC-  
 H/W/L  
 .950  
 .900  
 1.000

ALPHA  
 RN/L  
 30.000  
 1.000

PARAMETRIC VALUES  
 BETA  
 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

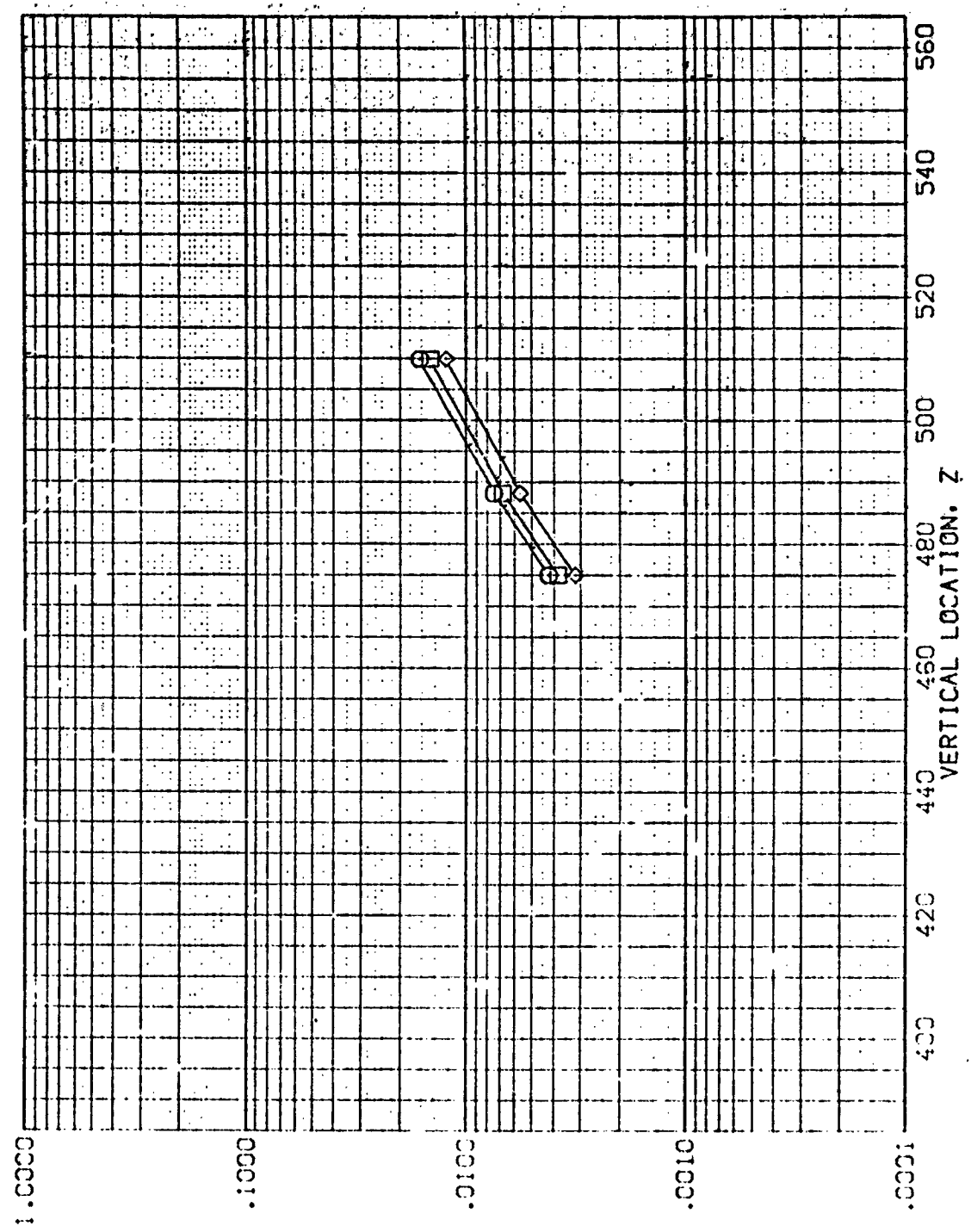


FIG. 13 OMS PODS, ORBITER ALONE

(REVC20)

AMES 3.5-195 IH28 01 QMS PODS

SYMBOL  
◇ □

HA/W-T X/L MACH  
.850 .900 5.219  
.900 1.000

PARAMETRIC VALUES  
ALPHA 30.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

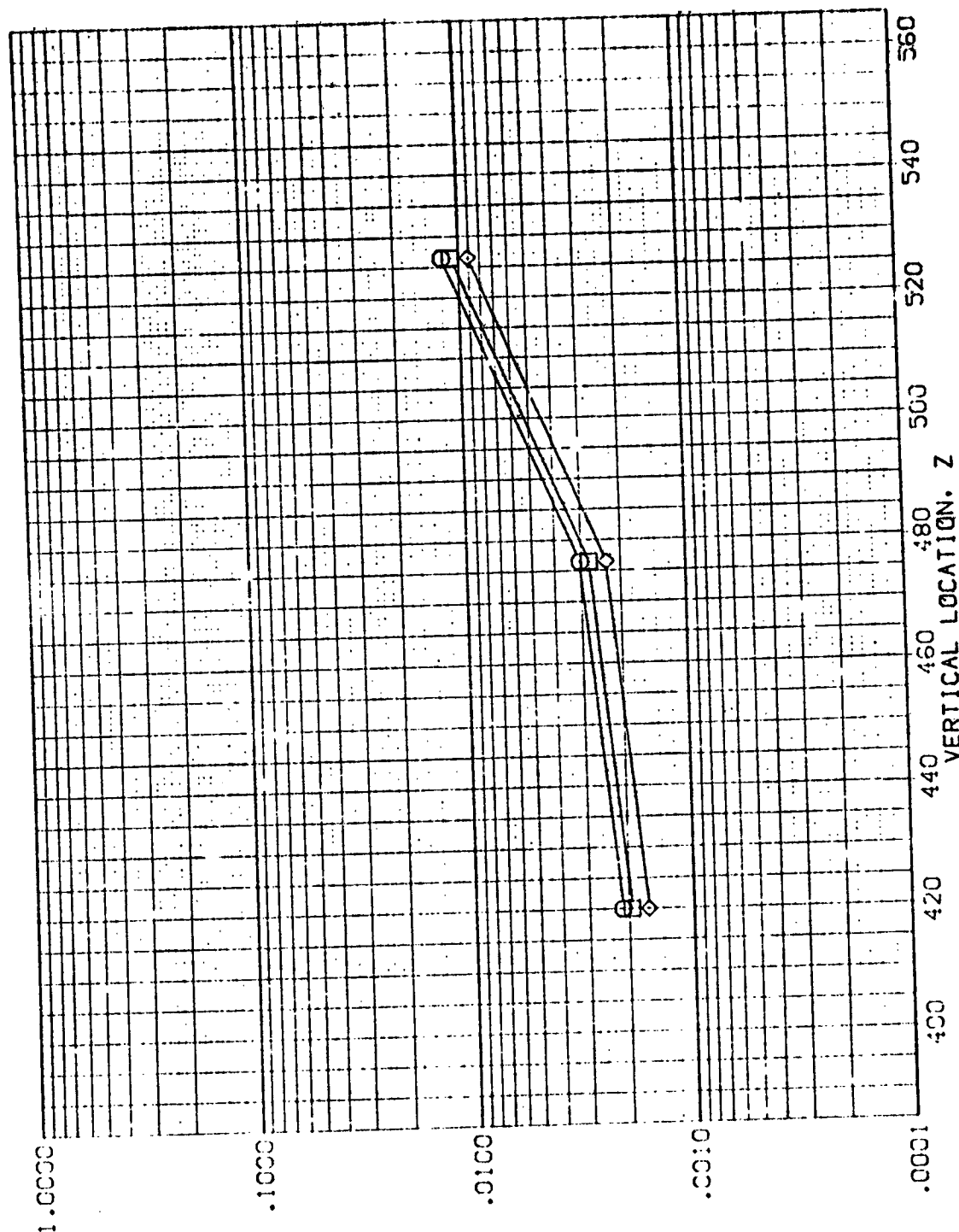


FIG. 13 QMS PODS, ORBITER ALONE

(REVC211)

PARAMETRIC VALUES

ALPHA C=0.000 BETA .000

RN/L 1.000

AMES 3.5-195 IH28 01 OMS PODS

SYMBOL HAW/HT X/L WACH

◇ □ .850 .825 5.220

□ .900

◇ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

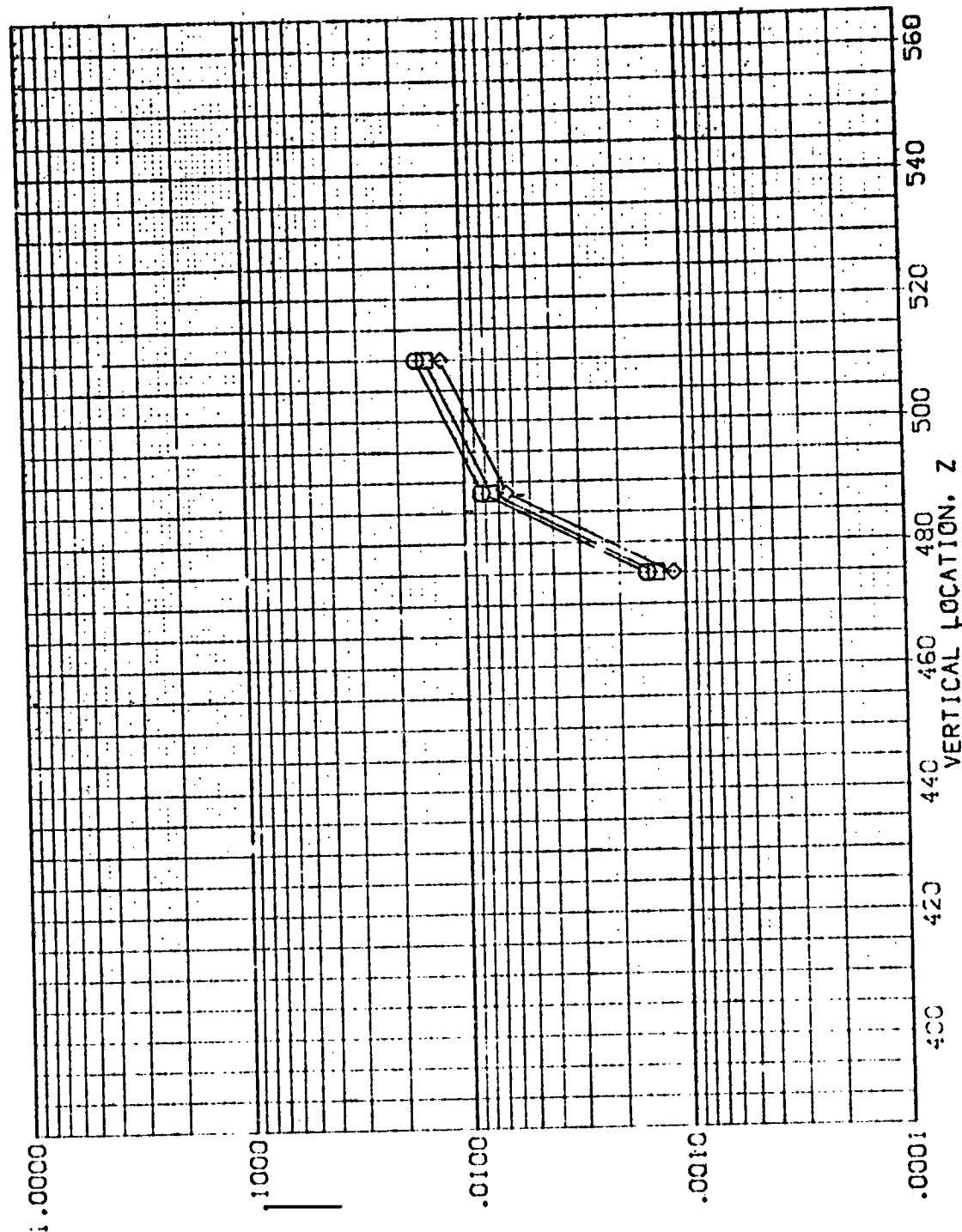


FIG. 13 OMS PODS, ORBITER ALONE

AMES 3.5-195 1H28 01 QMS P00S

(REVC21)

SYMBOL  
 .850  
 .900  
 1.000

M/L MACH  
 .900 5.220

PARAMETER VALUES  
 ALPHA 60.000  
 BETA 1.000  
 RN/L .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

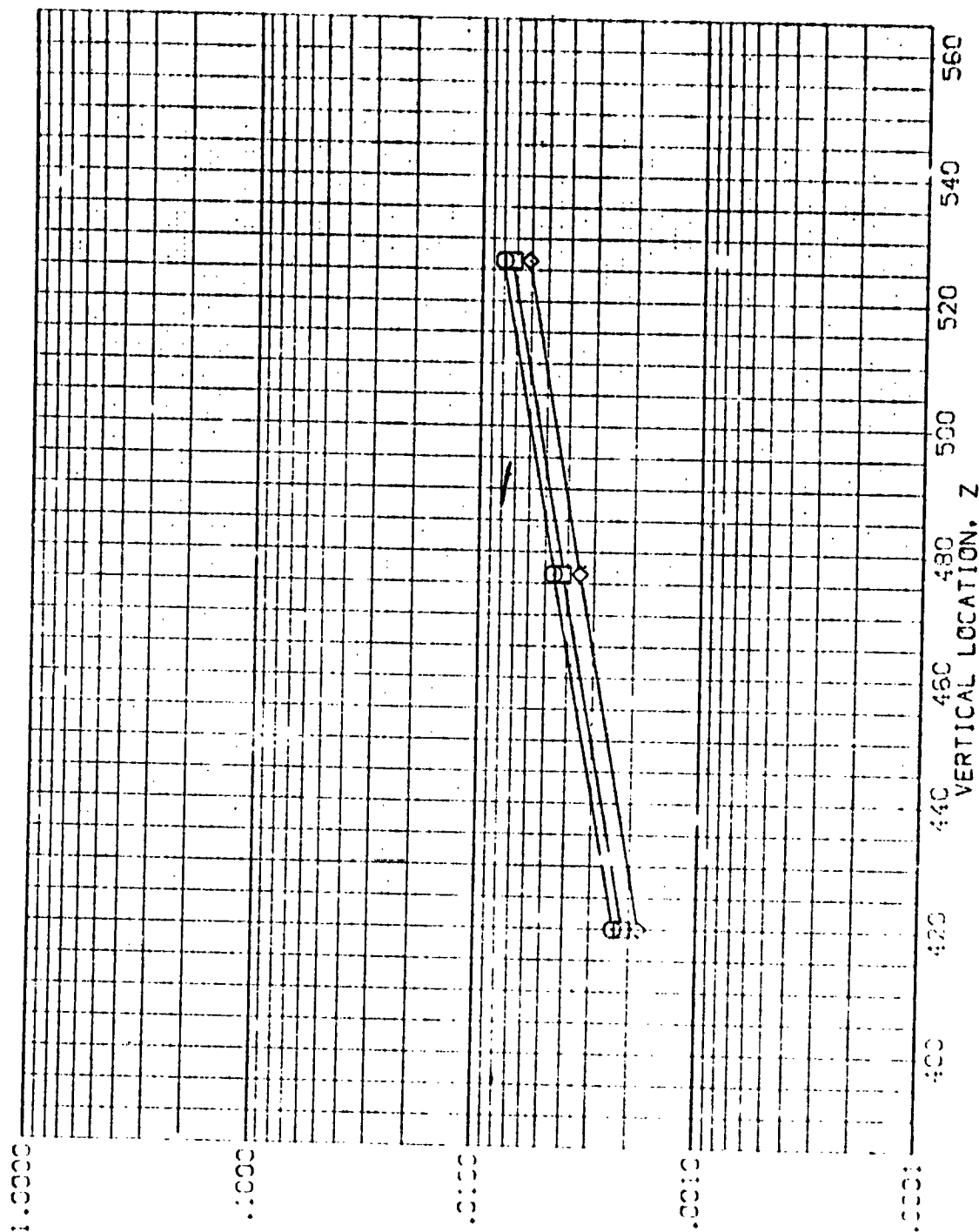


FIG. 13 QMS P00S, ORBITER ALONE

AMES 3.5-195 1H28 01 CMS PODS

(REVC22)

PARAMETRIC VALUES  
ALPHA 90.000 BETA .000  
RN/L 1.000

SWBC- HAW/L X/L MACH  
.850 .825 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

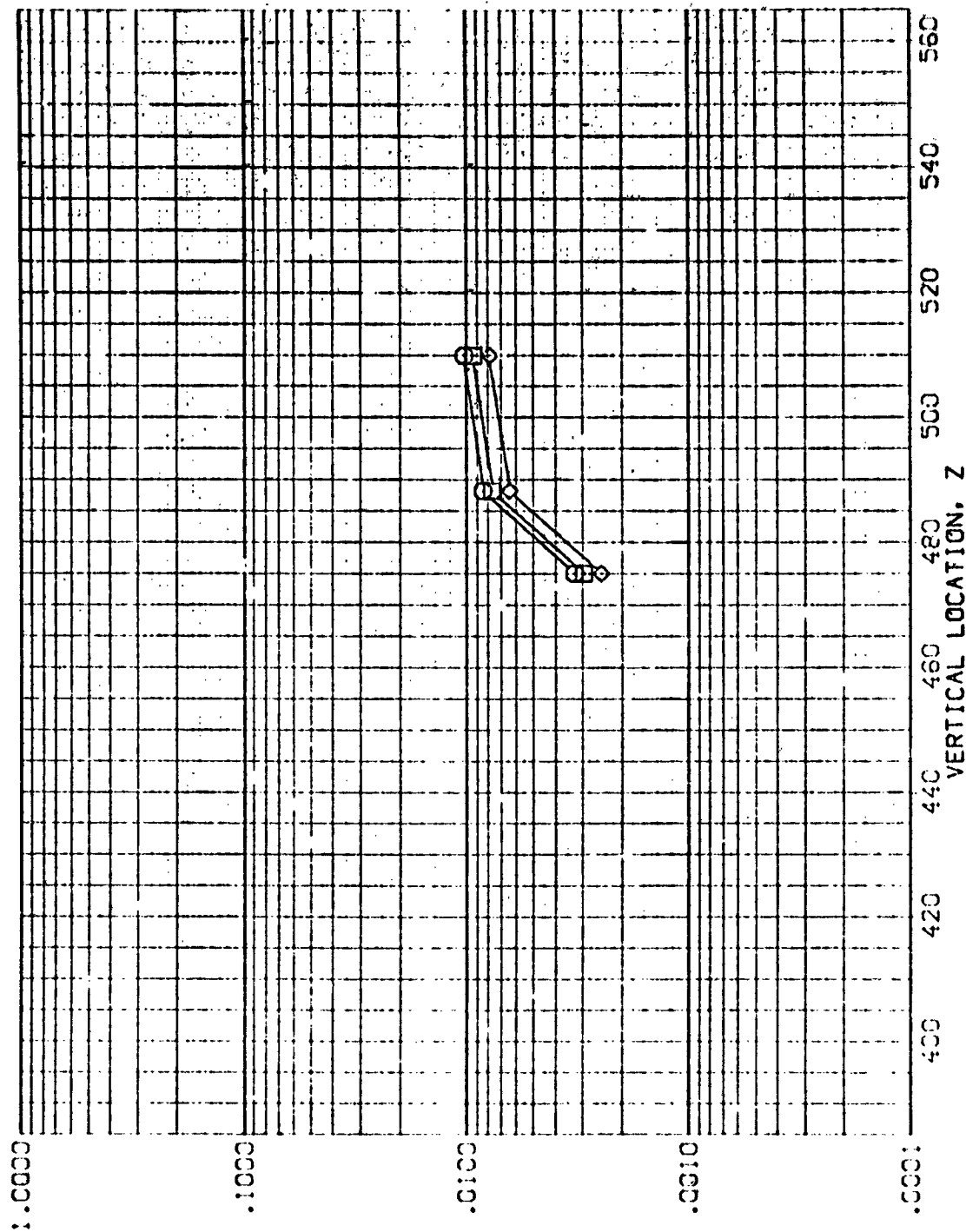


FIG. 13 CMS PODS, ORBITER ALONE

AMES 3.5-195 1-28 Q1 QMS PODS

(REV C22)

SYNTH HAWAII V/L WACH  
 .850 .900 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA BETA  
 .000 .000  
 .000 .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

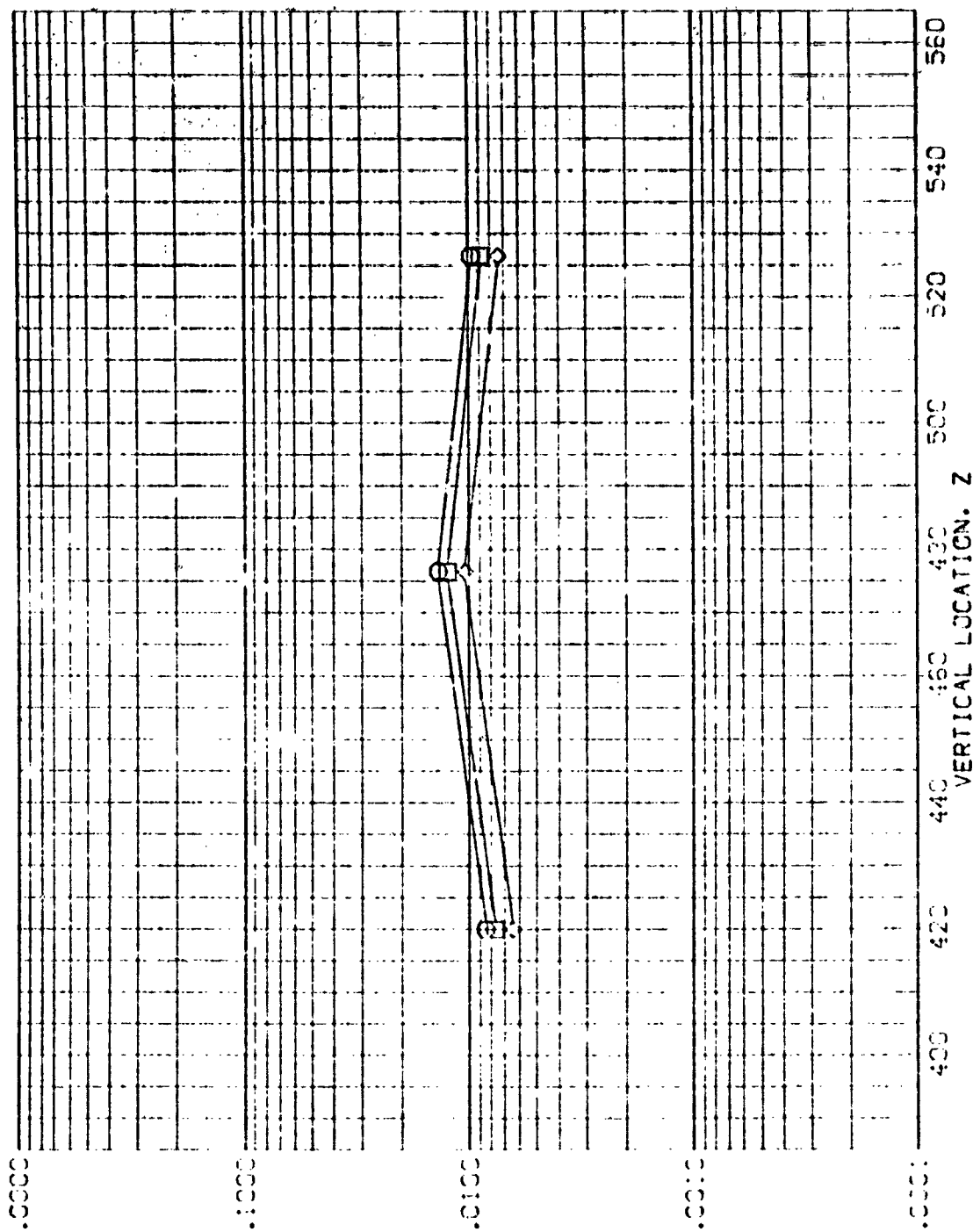


FIG. 13 QMS PODS, ORBITER ALONE

AVES 3.5-195 1428 01 QMS PODS

(REVC23)

PARAMETRIC VALUES  
 ALPHA 120.000 BETA .000  
 R1/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

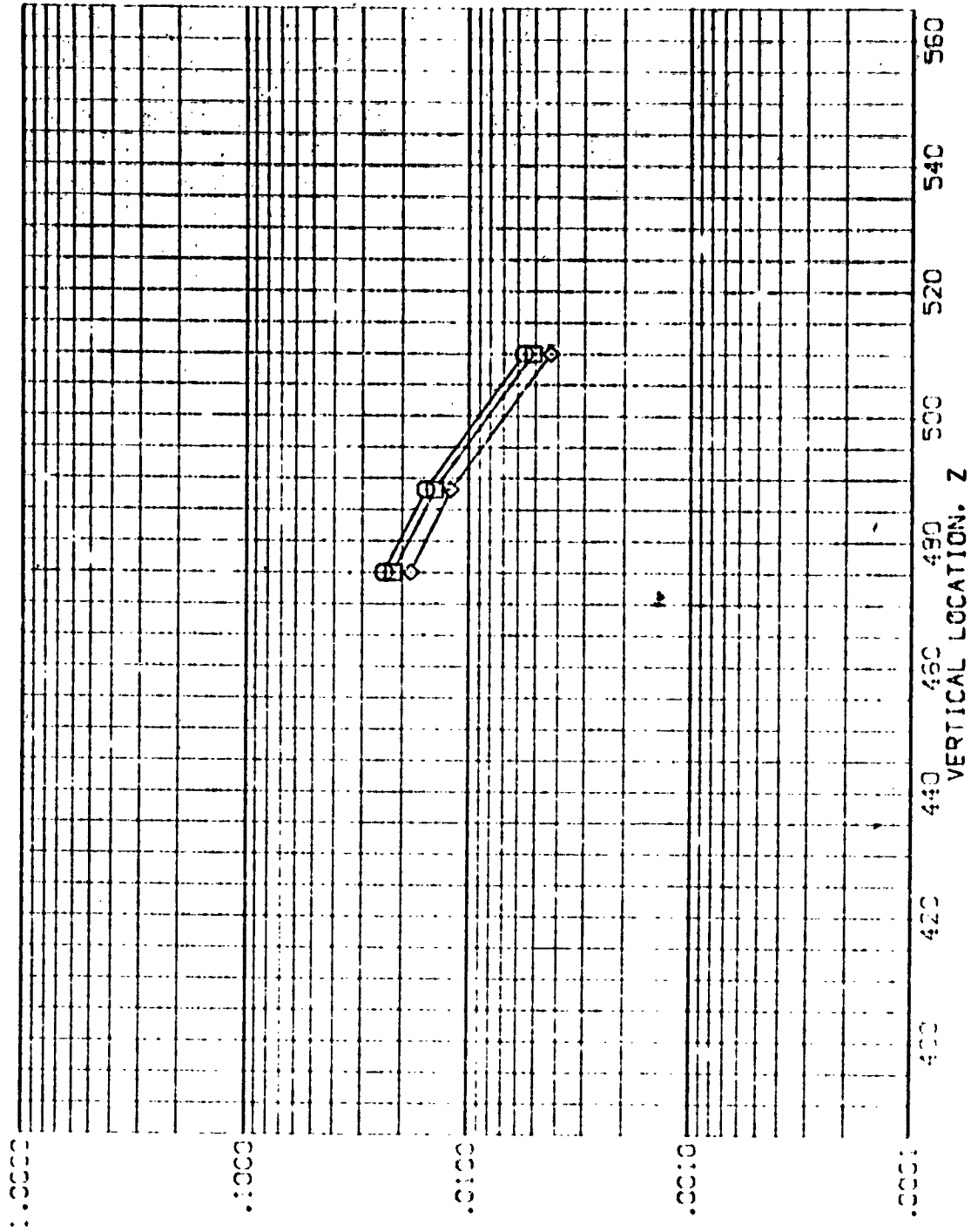


FIG. 13 QMS PODS, ORBITER ALONE



CASE 3.5-105 PAGE 01 CMS PODS (RE.0000)  
 MACH 1.000 5.000 1.000  
 ALPHA 0.000 0.000 0.000  
 BETA 0.000 0.000 0.000

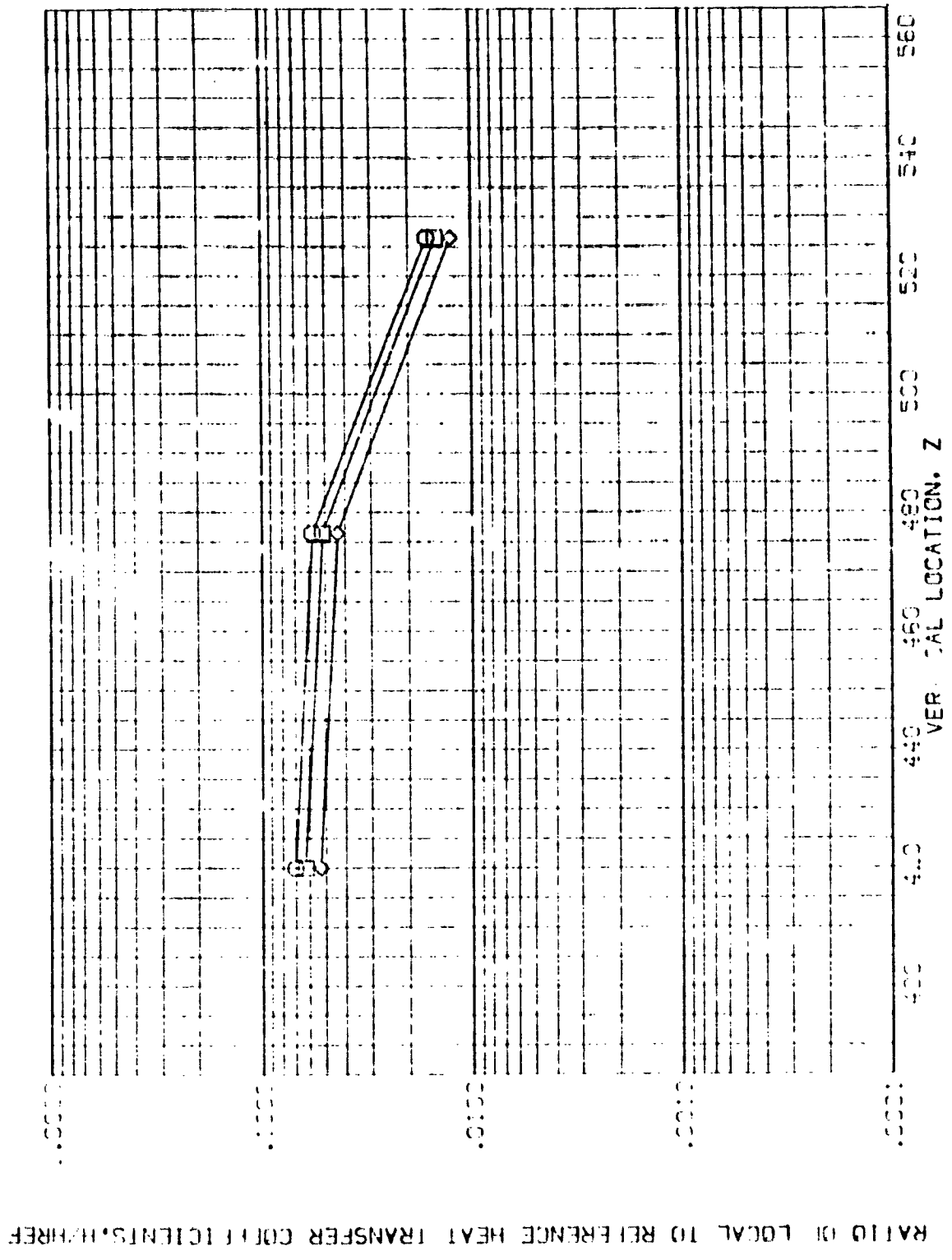


FIG. 13 CMS PODS. ORBITER ALONE

AVES 3.5-195 IH28 C: QMS PODS

(REVC24)

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
SV/L 1.000

SVES- WAVE/IN V/L W/L  
.850 .825 5.020  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

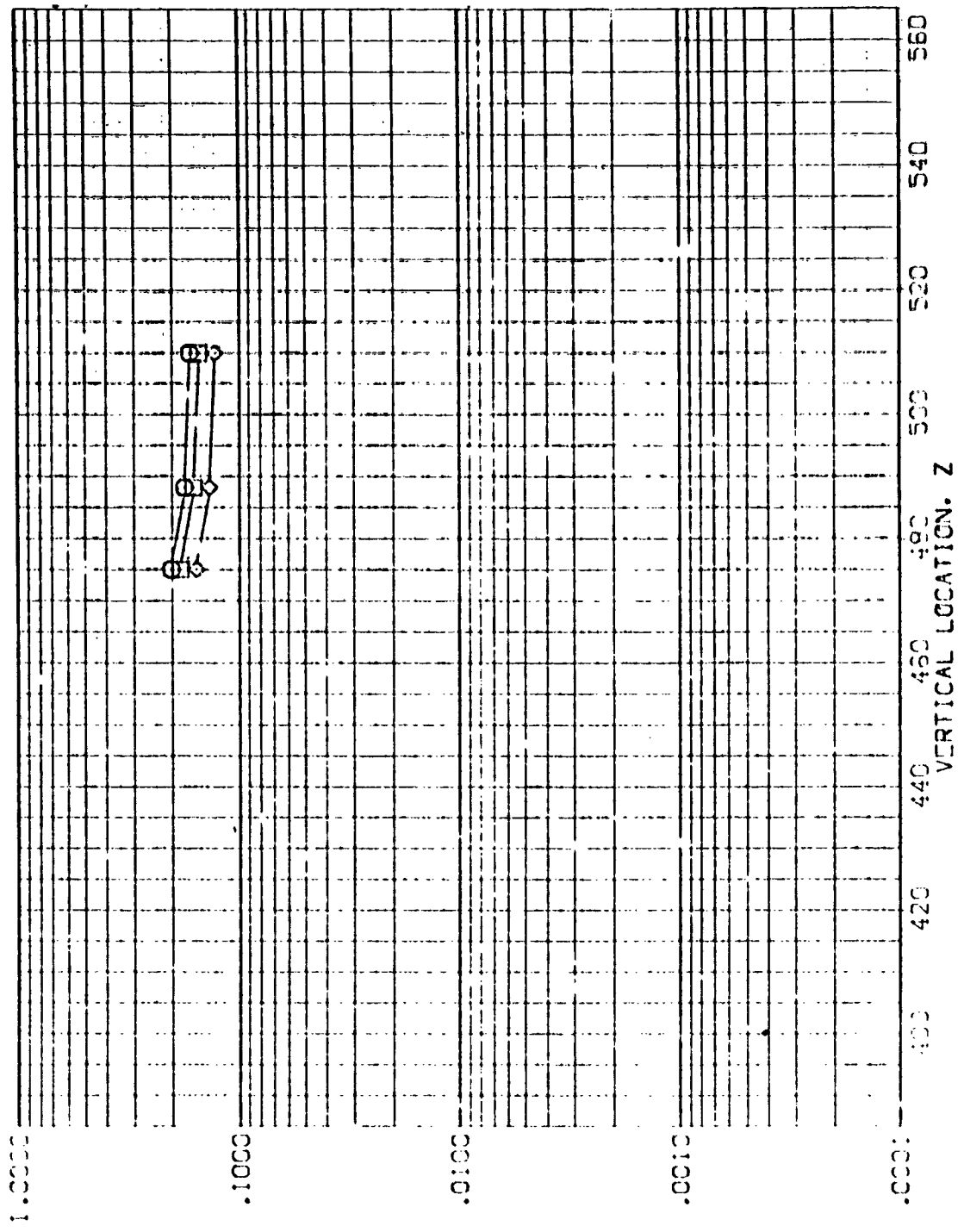


FIG. 13 QMS PODS, ORBITER ALONE

AMES 3.5-195 IH28 01 QMS PODS

(REV C24)

SYMBOL  
 ◇ 1.0  
 ○ .85  
 ○ .90  
 ○ .95  
 ○ 1.00

WALL/HT  
 .85  
 .90  
 .95  
 1.00

MACH  
 5.220

PARAMETRIC VALUES  
 ALPHA -120.000  
 BETA 1.000  
 RAYL .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

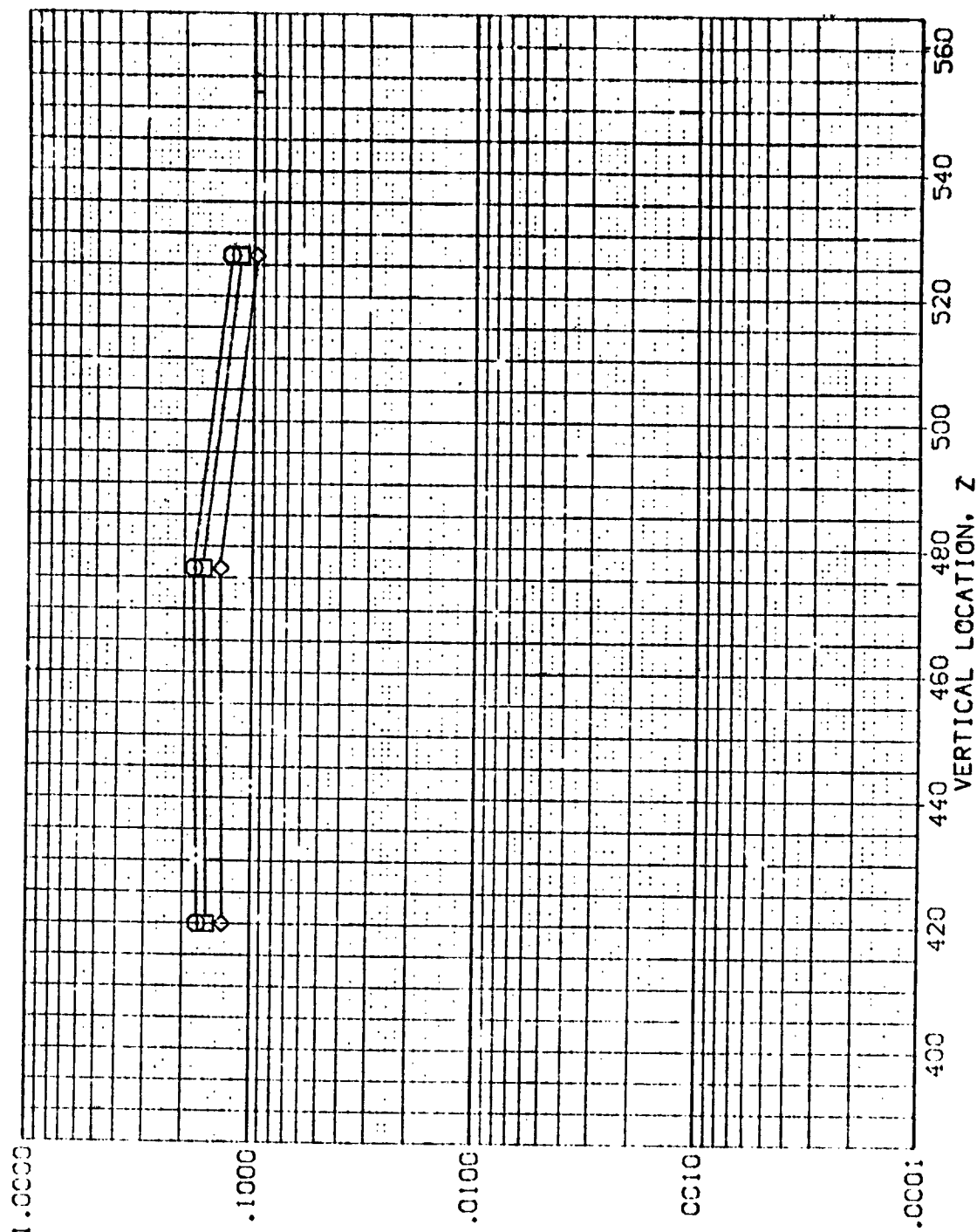


FIG. 13 QMS PODS, ORBITER ALONE

REPRODUCTION OF  
 ORIGINAL DATA

AMES 3.5-195 IH28 01 OMS PODS

(REVC25)

SYMBOL  
☐ ☐ ☐

HAW/HT  
 .850  
 .900  
 1.000

X/L  
 .825

MACH  
 5.219

ALPHA  
 RN/L

PARAMETRIC VALUES  
 .00 .300 .500  
 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

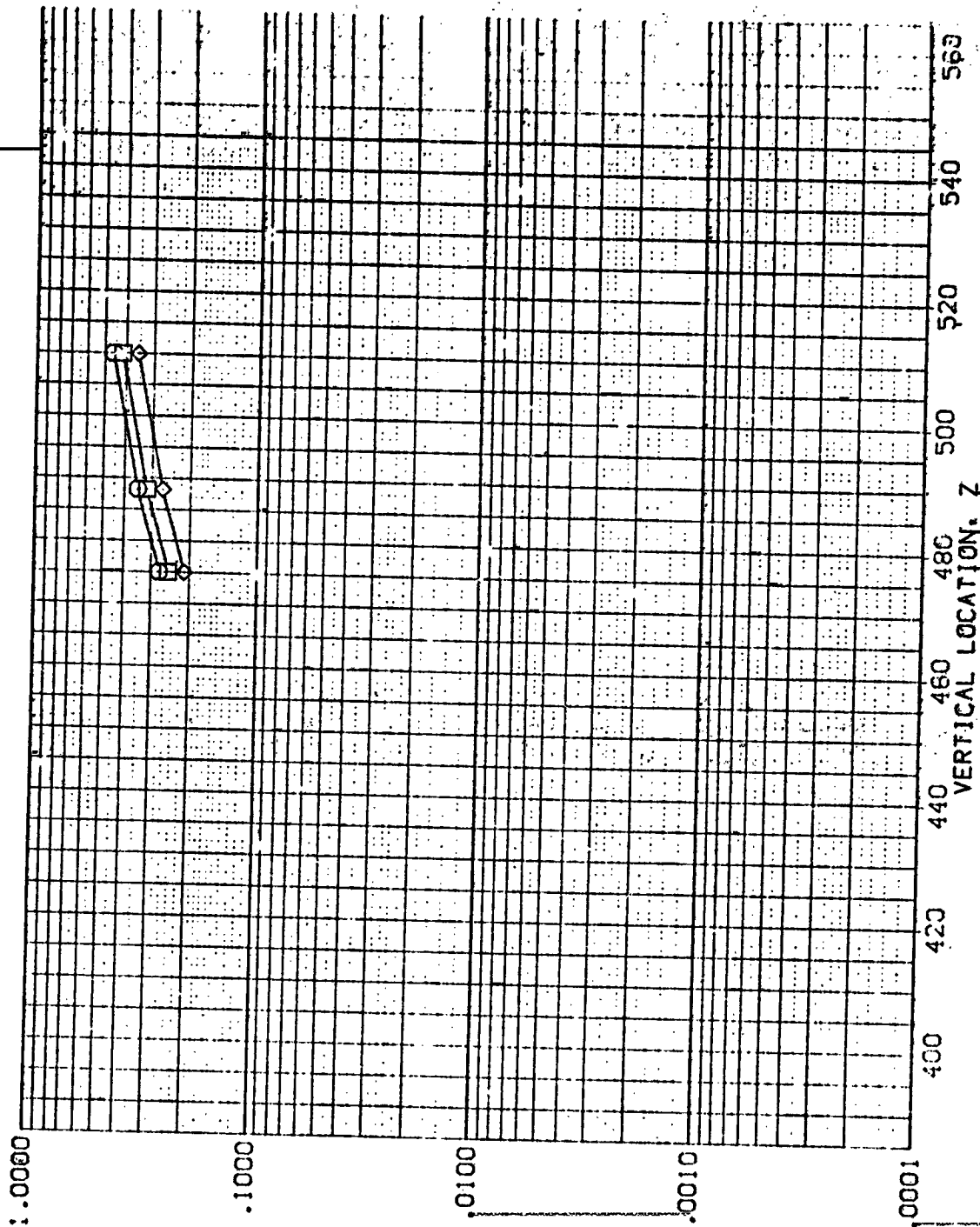


FIG. 13 OMS PODS, ORBITER ALONE

AMES 3.5-195 1H28 01 QMS PODS

(REVC25)

SYMBOL HAWAHT X/L MACH  
 ◻ .850  
 ◻ .900  
 ◻ 1.000

PARAMETRIC VALUES  
 ALPHA -90.000  
 RN/L 1.000  
 BETA .000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

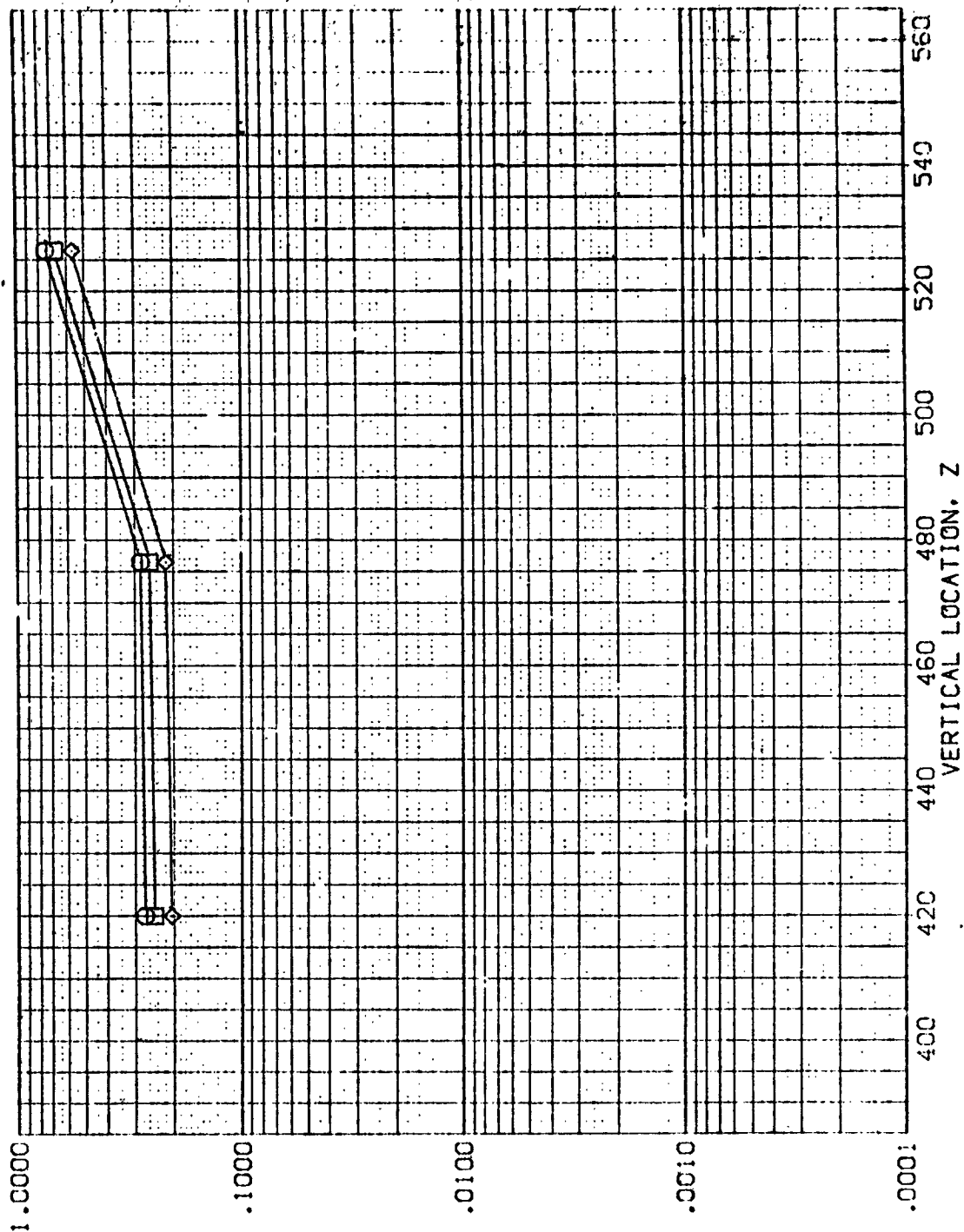


FIG. 13 QMS PODS, ORBITER ALONE

AMES 3.5-195 IH28 01 QMS PODS

(REVC26)

SYMBOL

MAV/HT  
.850  
.900  
1.000

X/L  
.825

MACH  
5.220

PARAMETRIC VALUES

-60.000 BETA

ALPHA

1.000

RN/L

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

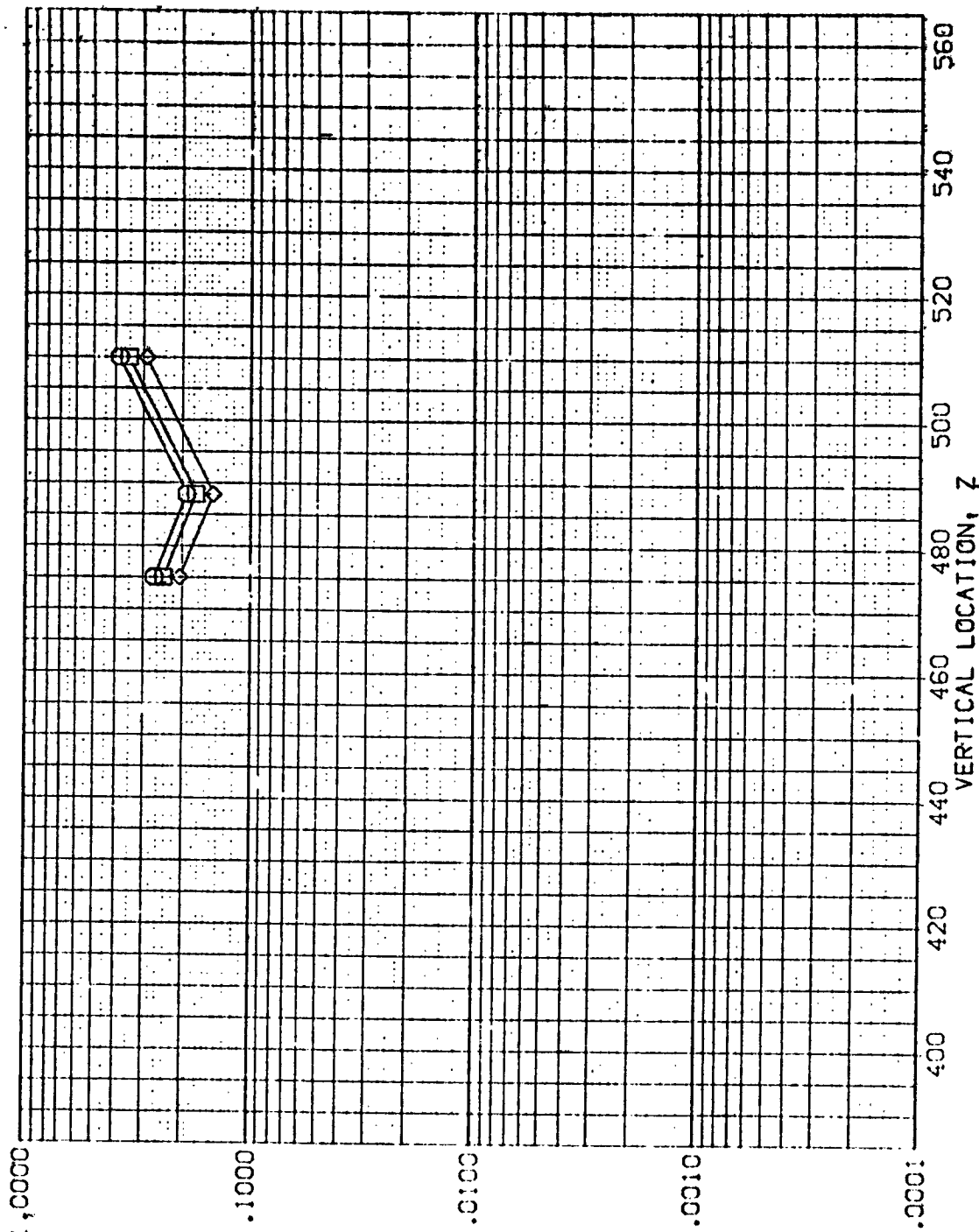


FIG. 13 QMS PODS, ORBITER ALONE

AMES 3.5-195 IH28 01 QMS PODS

[REVC26]

SYMBOL

MAW/WT .850  
.900  
1.000

MACH

X/L .900

5.220

PARAMETRIC VALUES  
ALPHA  
RN/L -67.000  
BETA  
1.000

.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

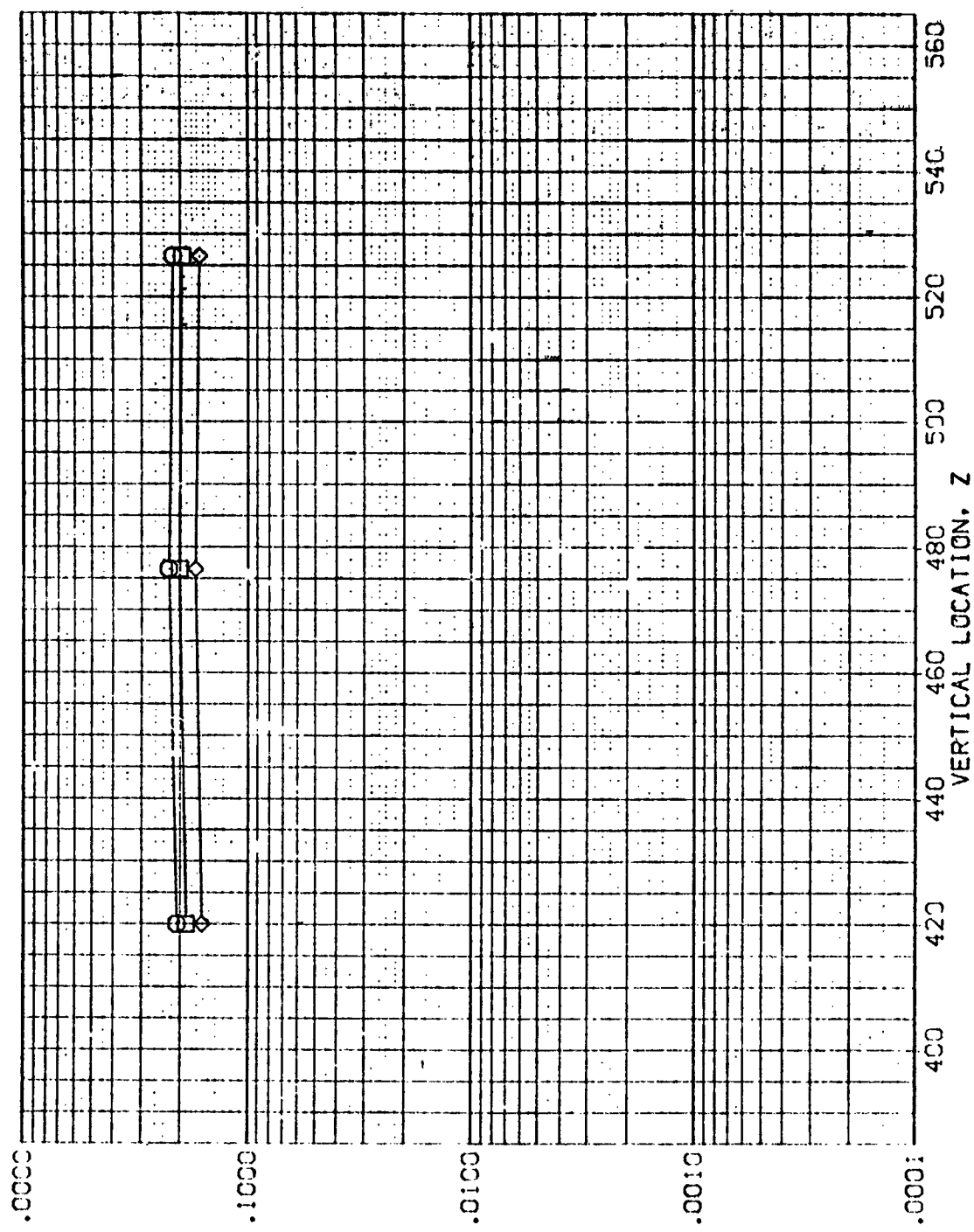


FIG. 13 QMS PODS, ORBITER ALONE

AMES 3.5-195 IH28 G1 CMS PODS

(REVC27)

PARAMETRIC VALUES  
 ALPHA -30.000  
 BETA 1.000  
 R<sub>0</sub>/L .000

SYMBOL MACH X/L  
 ◇ .850  
 □ .900  
 ○ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

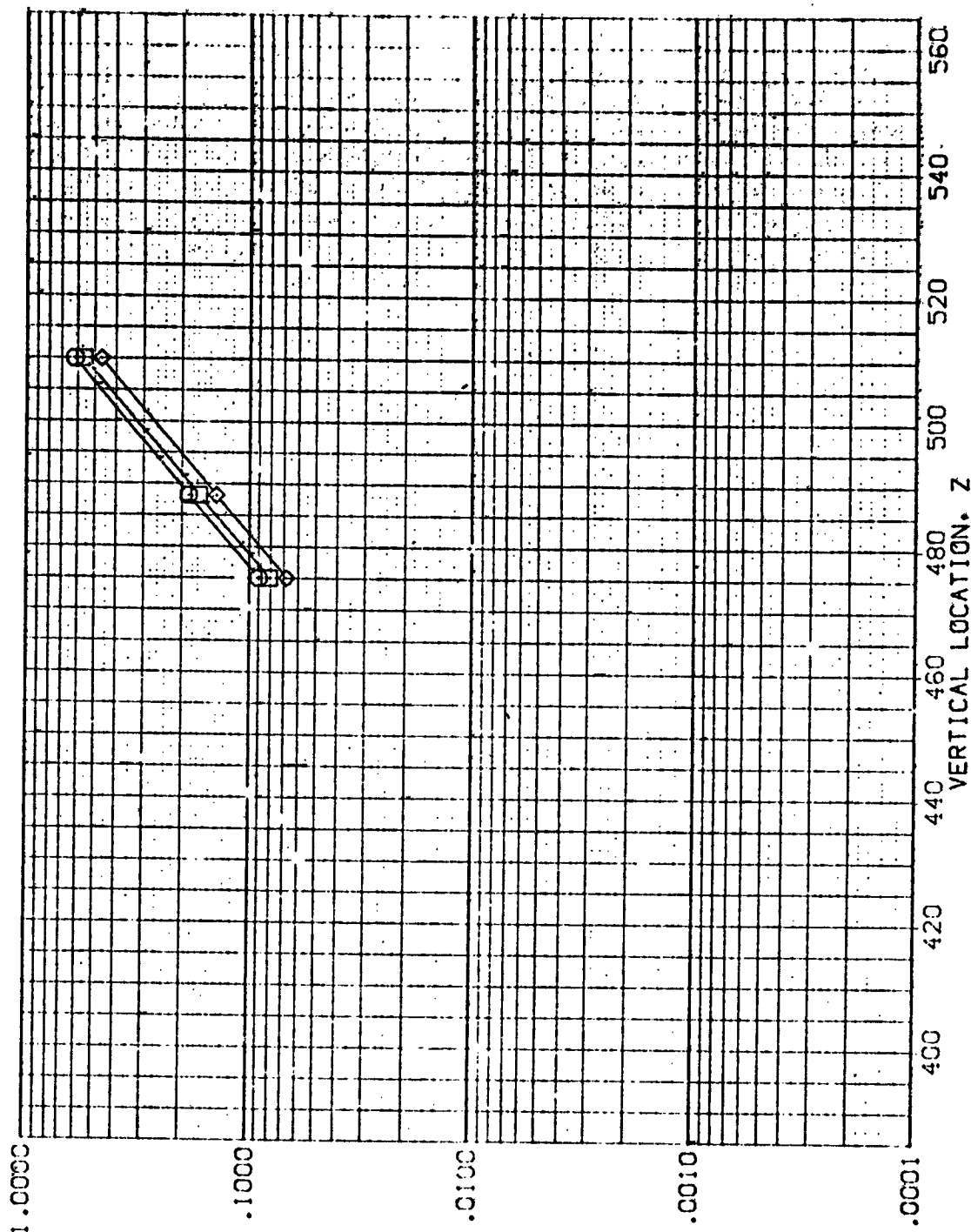


FIG. 13 CMS PODS, ORBITER ALONE



(REVC27)

AMES 3.5-195 1H28 01 OMS PODS

SYMBOL MAX/HT X/L MACH  
.850  
.900  
1.000

PARAMETRIC VALUES  
ALPHA -0.000 BETA .000  
RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

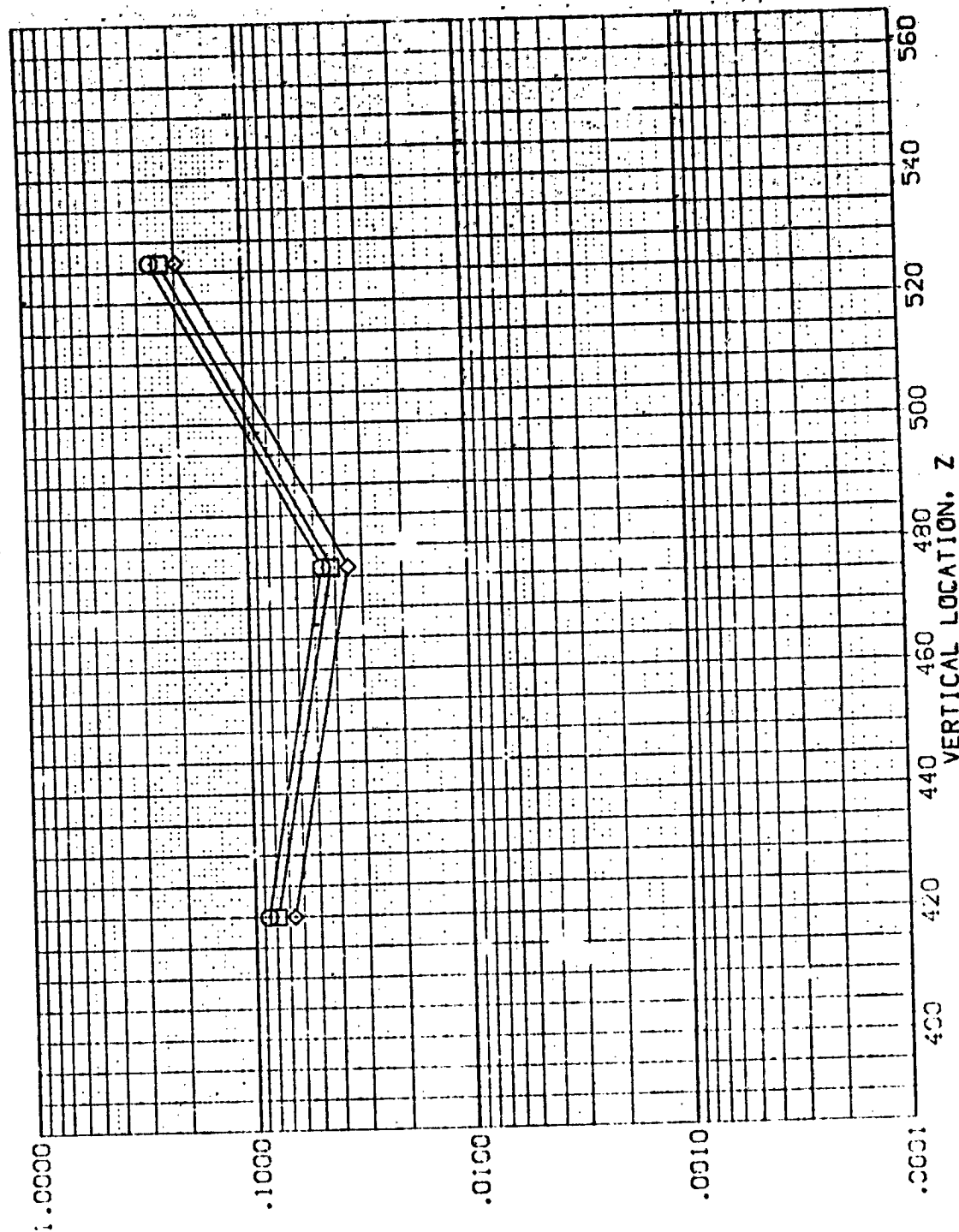


FIG. 13 OMS PODS, ORBITER ALONE

DATA SET SYMBOL      CONFIGURATION DESCRIPTION      ALPHA      BETA      RV/L

(REV19)	AVES 3.5-195	128 01	CMS	PCDS	1.000
(REV20)	AVES 3.5-195	128 01	CMS	PCDS	1.000
(REV21)	AVES 3.5-195	128 01	CMS	PCDS	1.000
(REV22)	AVES 3.5-195	128 01	CMS	PCDS	1.000
(REV23)	AVES 3.5-195	128 01	CMS	PCDS	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

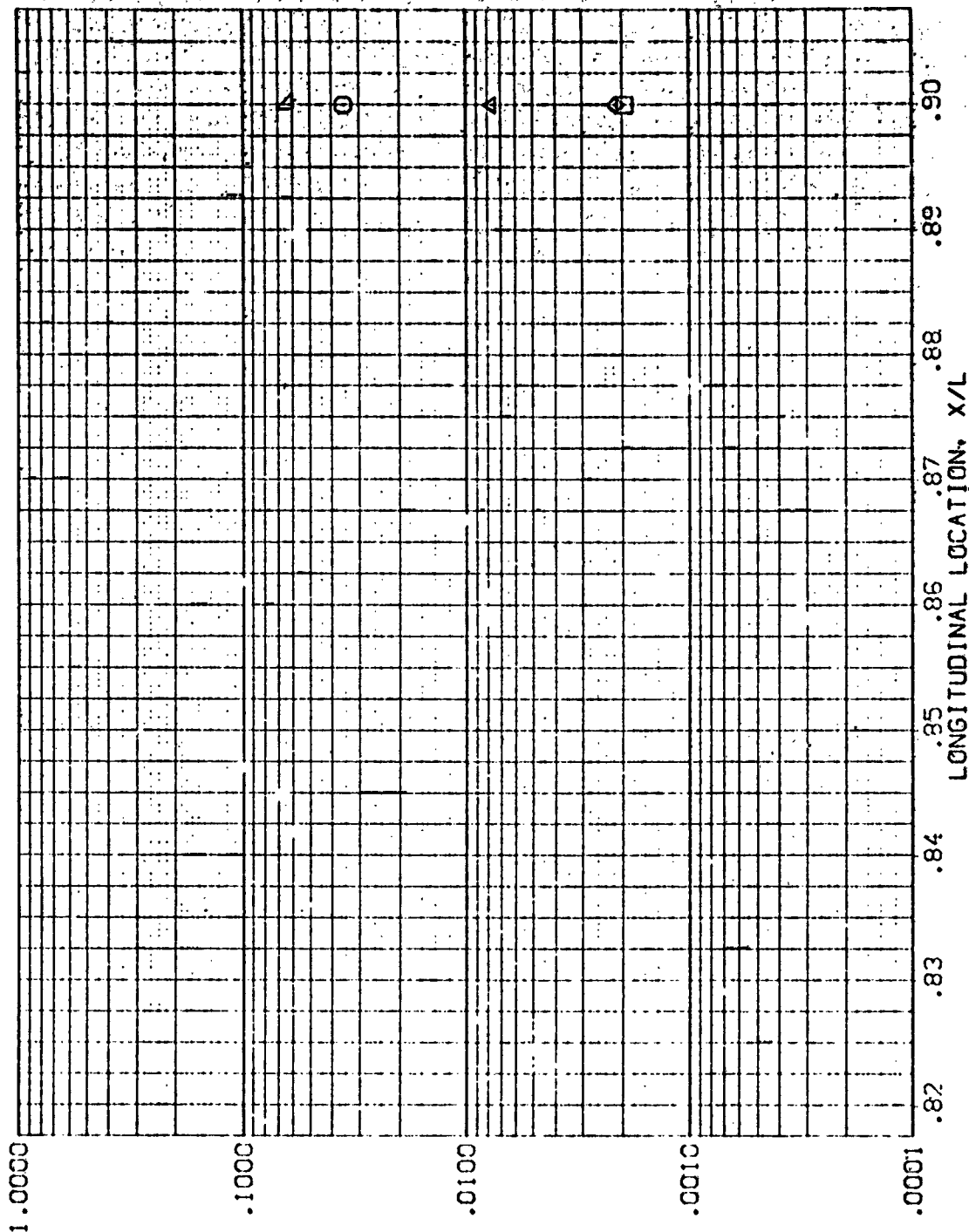


FIG. 13 CMS PODS, ORBITER ALONE

MACH = 5.300      HAW/HT = .900      Z = 420.000

DATA SET SYMBOL  
 (REV 191)  
 (REV 200)  
 (REV 210)  
 (REV 220)  
 (REV 230)

CONFIGURATION DESCRIPTION  
 AXES 3.5-135 1428 01 CWS 1325  
 AXES 3.5-135 1428 01 CWS 1325  
 AXES 3.5-135 1428 01 CWS 1325  
 AXES 3.5-135 1428 01 CWS 1325  
 AXES 3.5-135 1428 01 CWS 1325

ALPHA BETA PN/L  
 .000 .000 1.000  
 30.000 .000 1.000  
 60.000 .000 1.000  
 90.000 .000 1.000  
 120.000 .000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

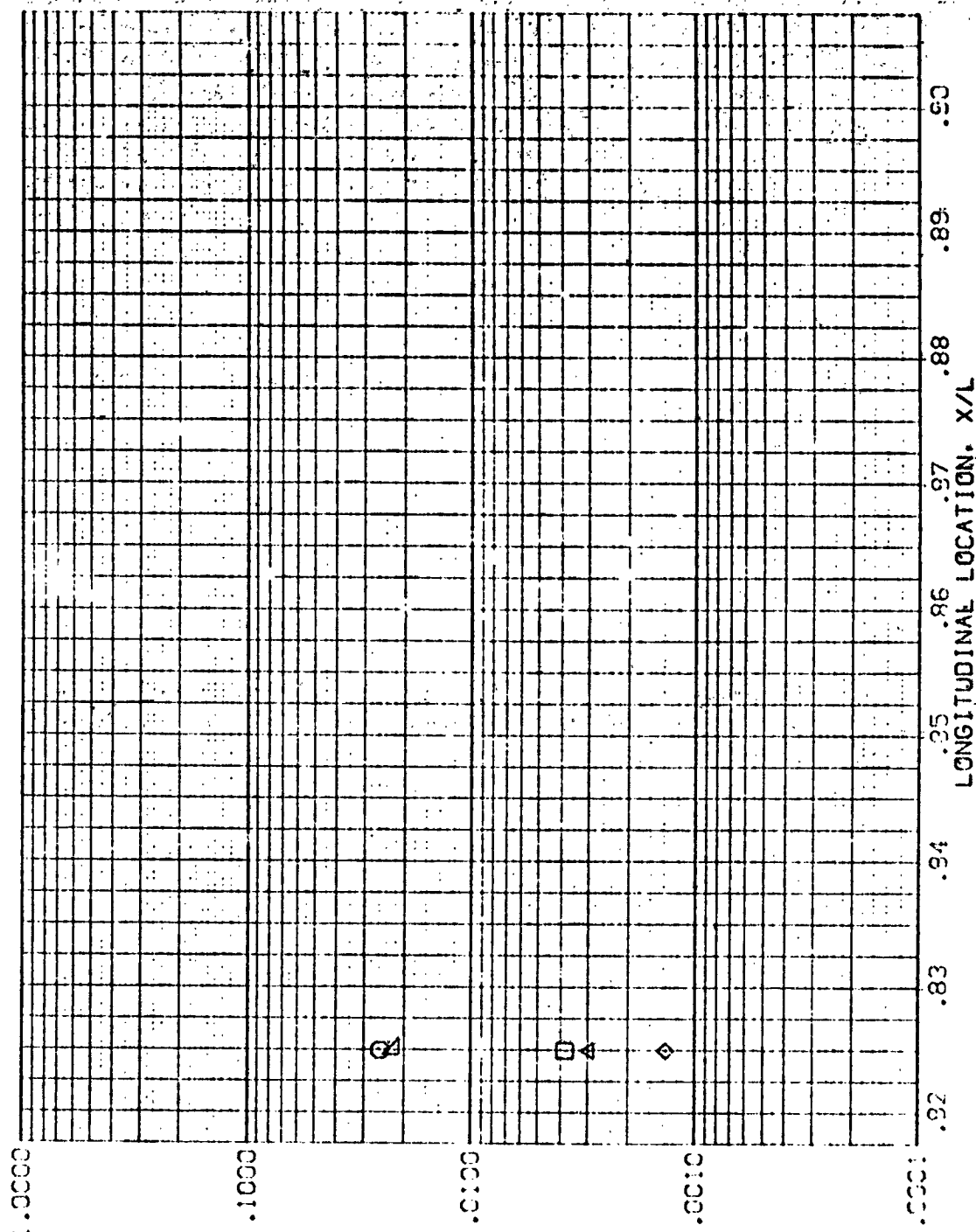


FIG. 13 OMS PODS, ORBITER ALONE

MAC = 5.300 HAW/HT = .900 Z = 475.000

	ALF.A	BETA	RN/L
1	.000	.000	1.000
2	30.000	.070	1.000
3	60.000	.000	1.000
4	90.000	.000	1.000
5	120.000	.000	1.000

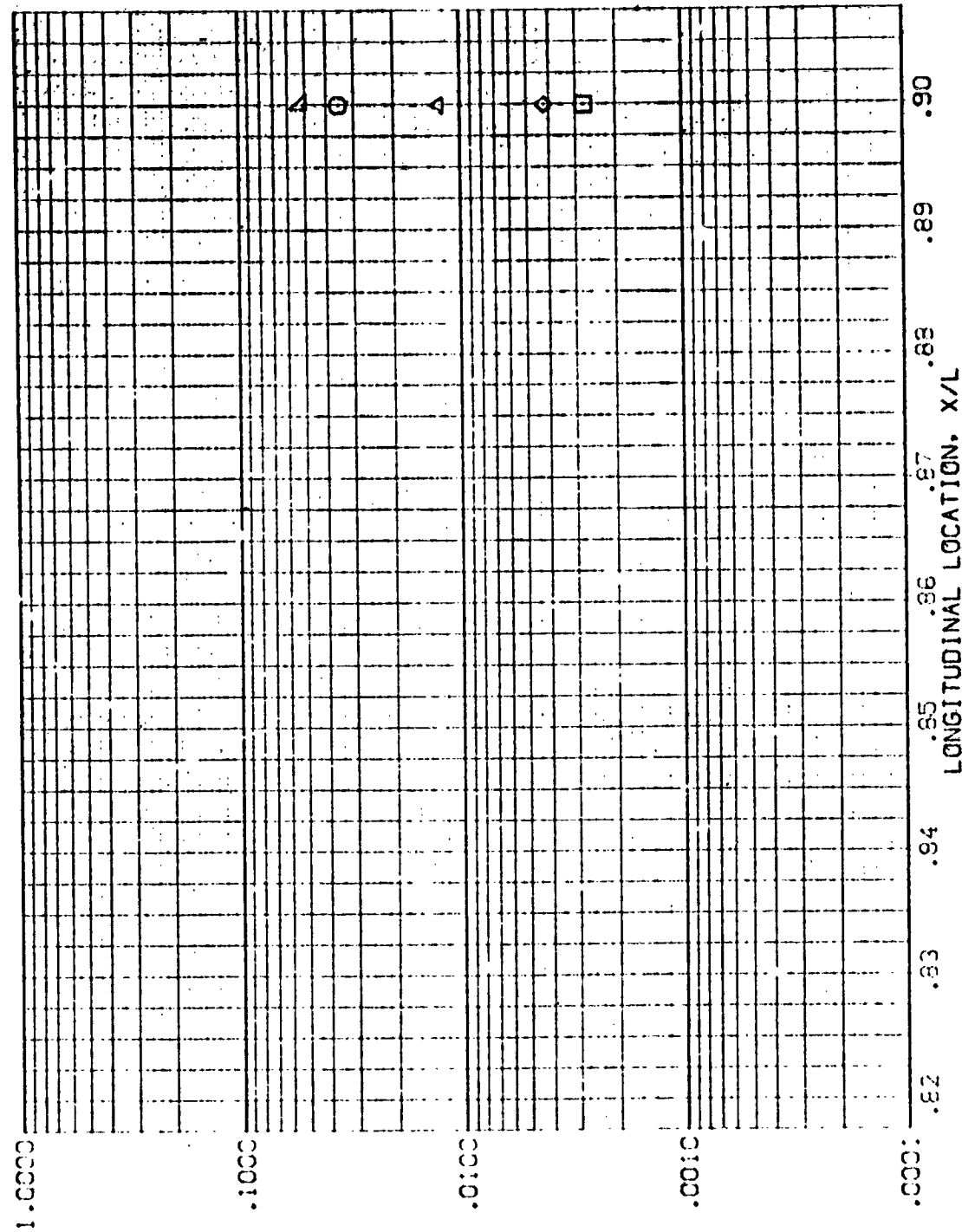


FIG. 13. OMS PODS, ORBITER ALONE

$$Z = 476.936 = 476.936$$

[illegible]

FIG. 13 GYS PODS. ORBITER ALONE

[illegible]



PART OF LINE A TO REFERENCE POINT TRANSFER CORRECTION

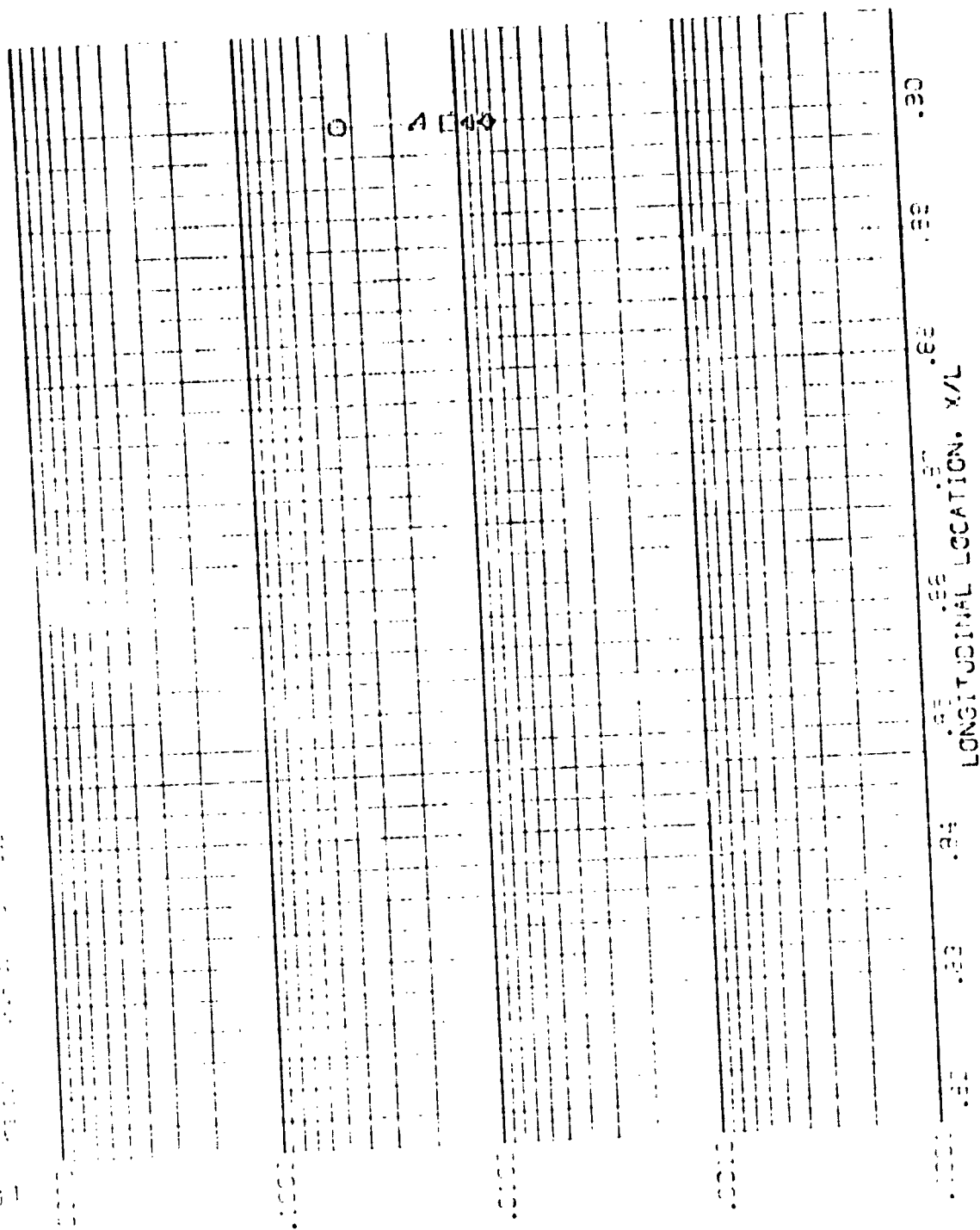


FIG. 13 3MS PODS. GREETER ALONE

508.980

A.D.A.	7
S.E.A.	6
E.O.L.	8

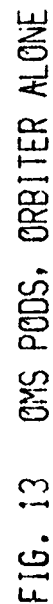
[illegible]

LONGITUDINAL LOCATION, X/L		
.95	.36	.89
.90		.90

FIG. 13 OMS PODS, ORBITER ALONE

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[illegible]
$$\text{MACH} = 5.330 \quad \text{MACH/HT} = .399 \quad Z = 475.000$$

PAGE 718

REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

DATA SET SYMBOL CONFIGURATION DESCRIPTION ALPHA BETA RWL  
 (REV19) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV27) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV28) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV29) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV30) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV31) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV32) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV33) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV34) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV35) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV36) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV37) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV38) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV39) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV40) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV41) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
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 (REV43) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
 (REV44) ARES 3.5-195 1428 01 OMS PODS .000 1.000  
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 (REV00) ARES 3.5-195 1428 01 OMS PODS .000 1.000

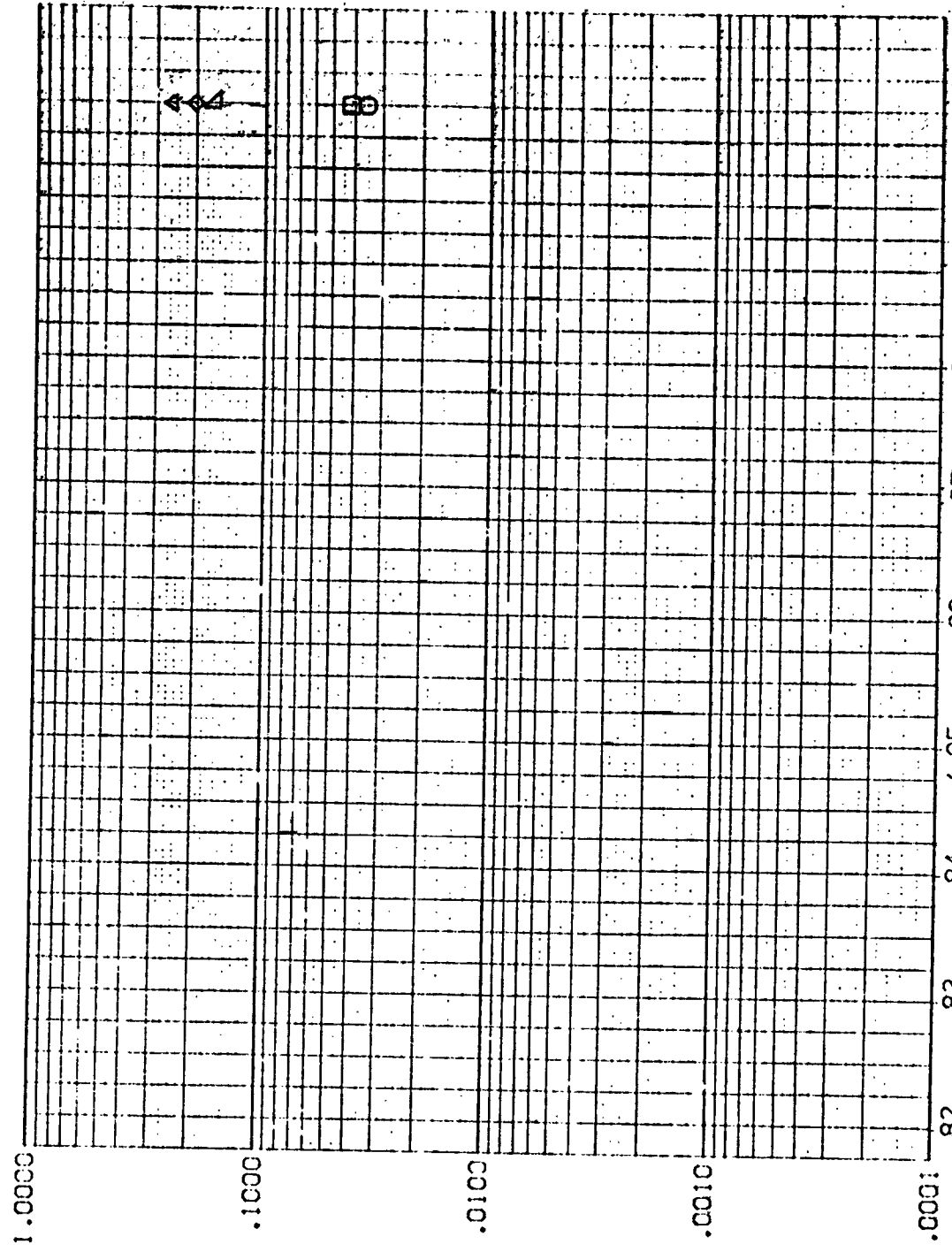
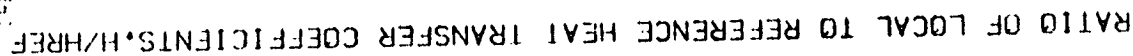


FIG. 13 OMS PODS, ORBITER ALONE

VAC = 5.300 HAW/HT = .900 Z = 476.650

011344

[illegible]
$$\begin{aligned} \text{---} \log \text{---} &= 5.333 & \text{---} \log \text{---} &= 48^{\circ}.300 \\ \text{---} \log \text{---} &= 5.333 & \text{---} \log \text{---} &= 48^{\circ}.300 \end{aligned}$$

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
AVES 3.5-195	128 CI	.000	.000	1.000
AVES 3.5-195	128 CI	.000	.000	1.000
AVES 3.5-195	128 CI	.000	.000	1.000
AVES 3.5-195	128 CI	.000	.000	1.000
AVES 3.5-195	128 CI	.000	.000	1.000
AVES 3.5-195	128 CI	.000	.000	1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

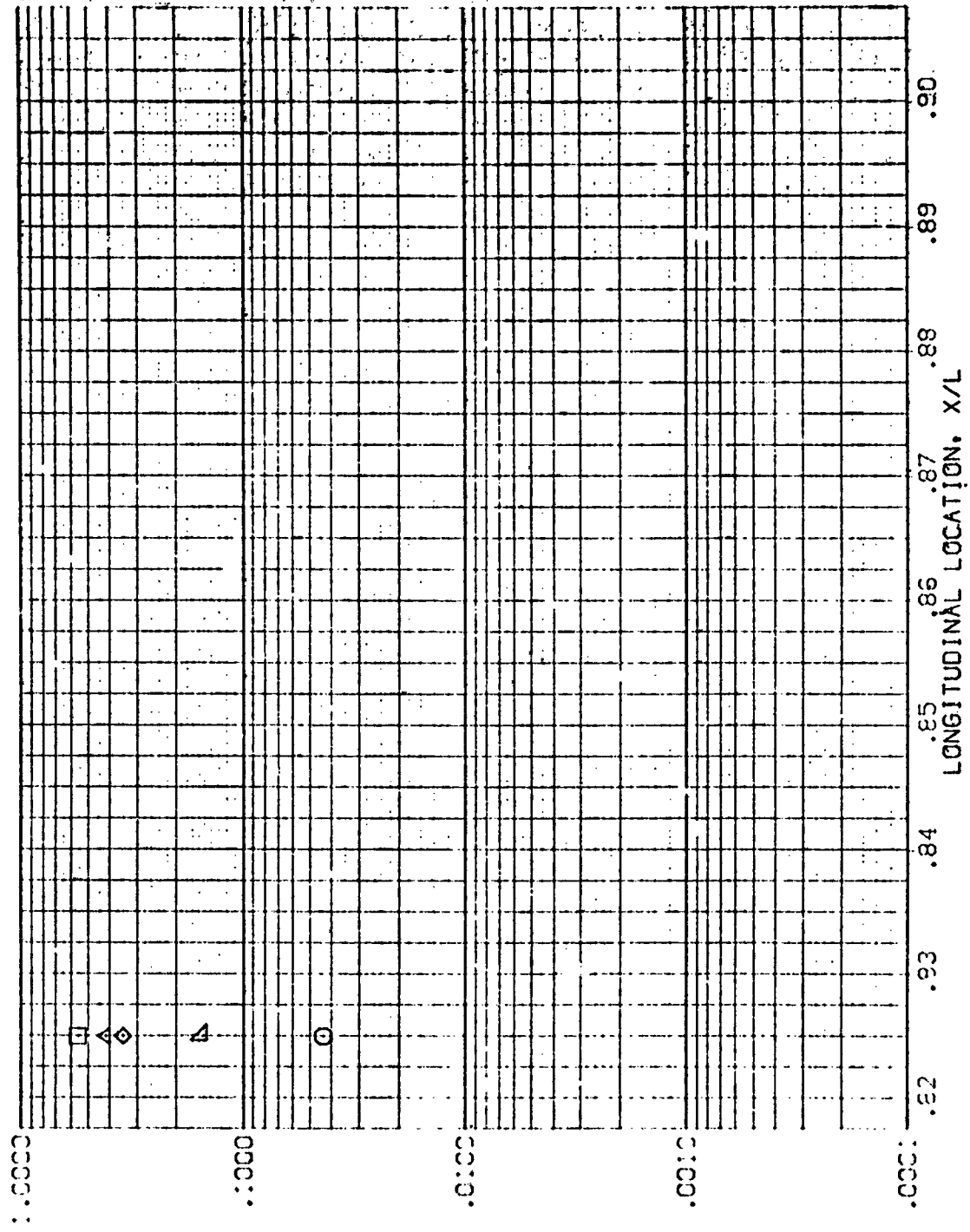


FIG. 13 OMS PODS, ORBITER ALONE

MACH = 5.200 HAW/HT = .900 Z = 510 000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

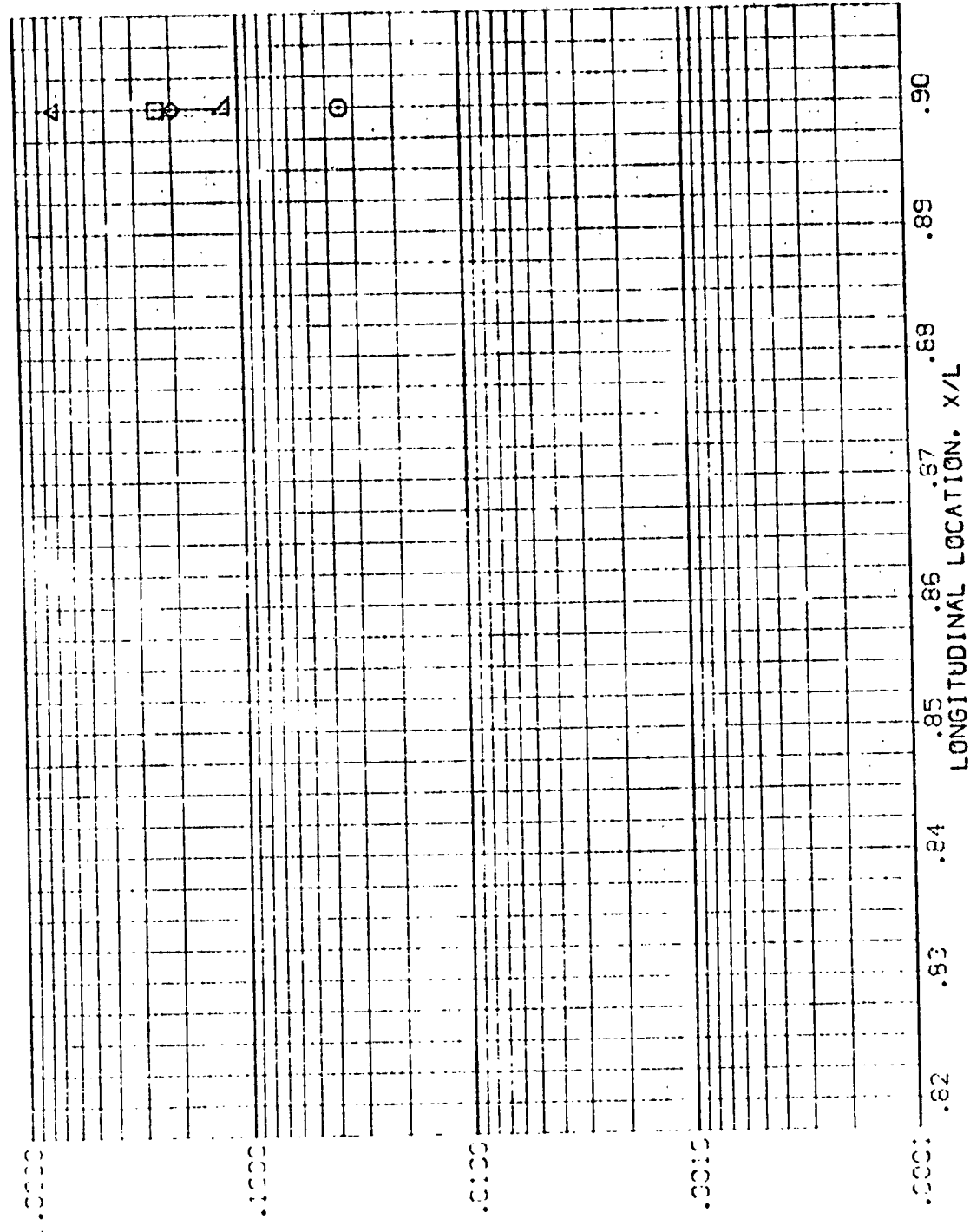


FIG. 13 CMS PODS, ORBITER ALONE

WAO = 5.300 HAW/HI = .900 Z = 526.650

AMES 3.5-195 1H28 01+T1 QMS PODS

(REV001)

Q170

WAVE- WAVE/WT X/L MACH  
 .850 .825 5.228  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA BETA  
 1.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

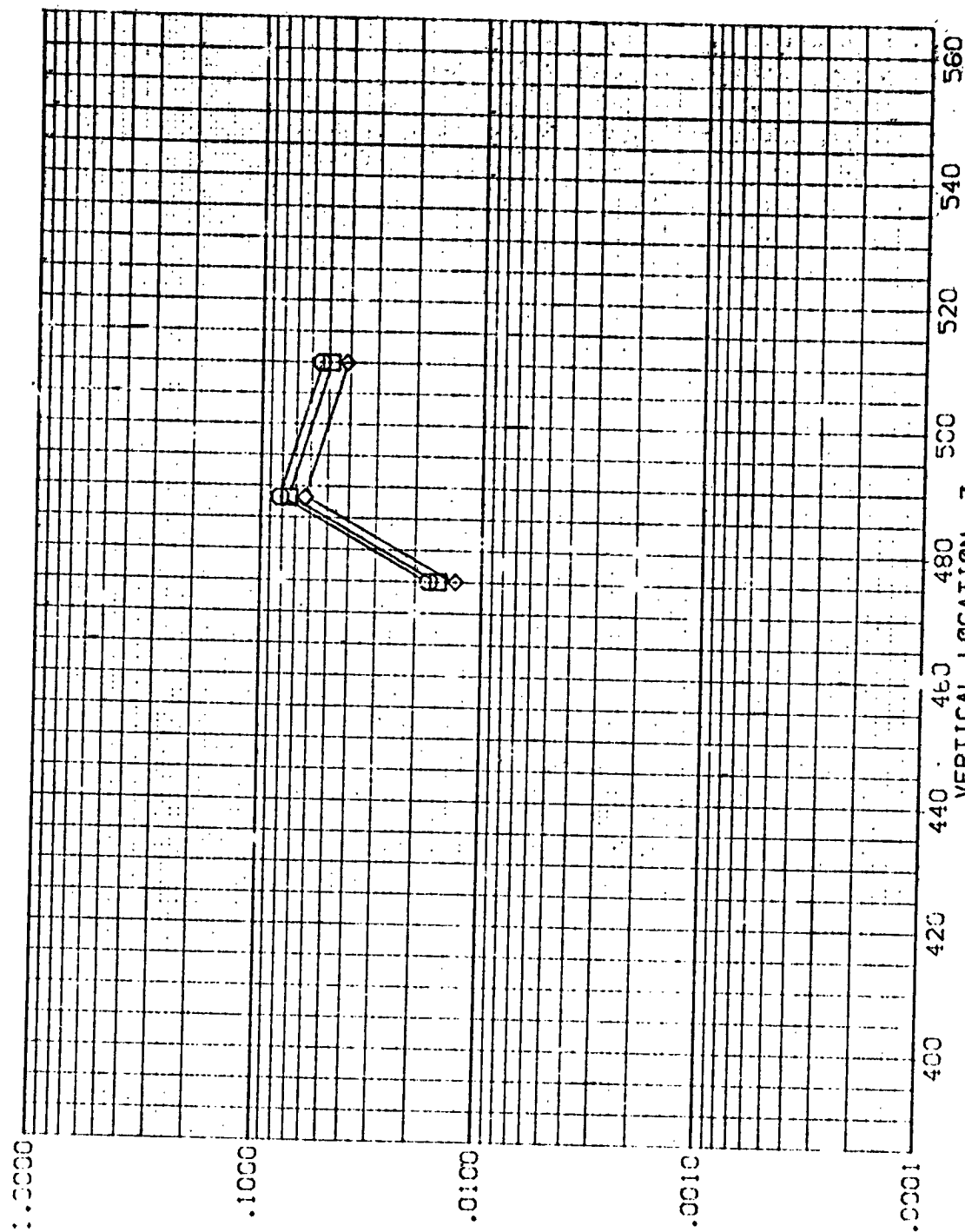


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

AYES 3.5-195 1P28 01+T1 CYS PODS

(REV001)

PARAMETRIC VALUES  
ALPHA  
PN/L

0.000  
0.000  
1.000

WAVELENGTH  
X/L  
MACH

0.850  
0.900  
5.228

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

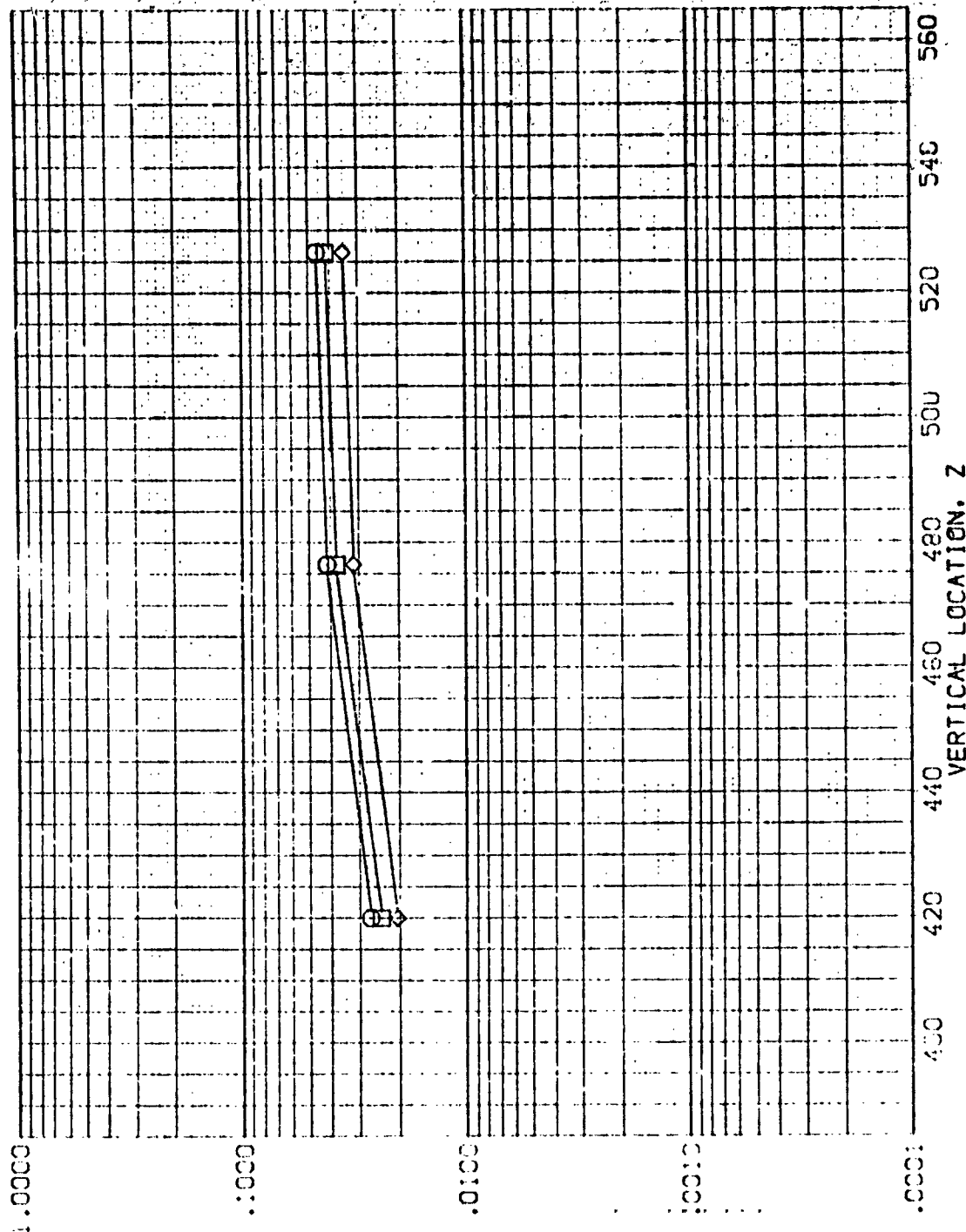


FIG. 14 CYS PODS, ORBITER IN PRESENCE OF THE TANK

AVES 3.5-195 1428 01+T1 0MS PODS

(REV02)

SYMBOL HAW/HT X/L VACH  
 .850 .825 5.219  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 3C .000 BETA .000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

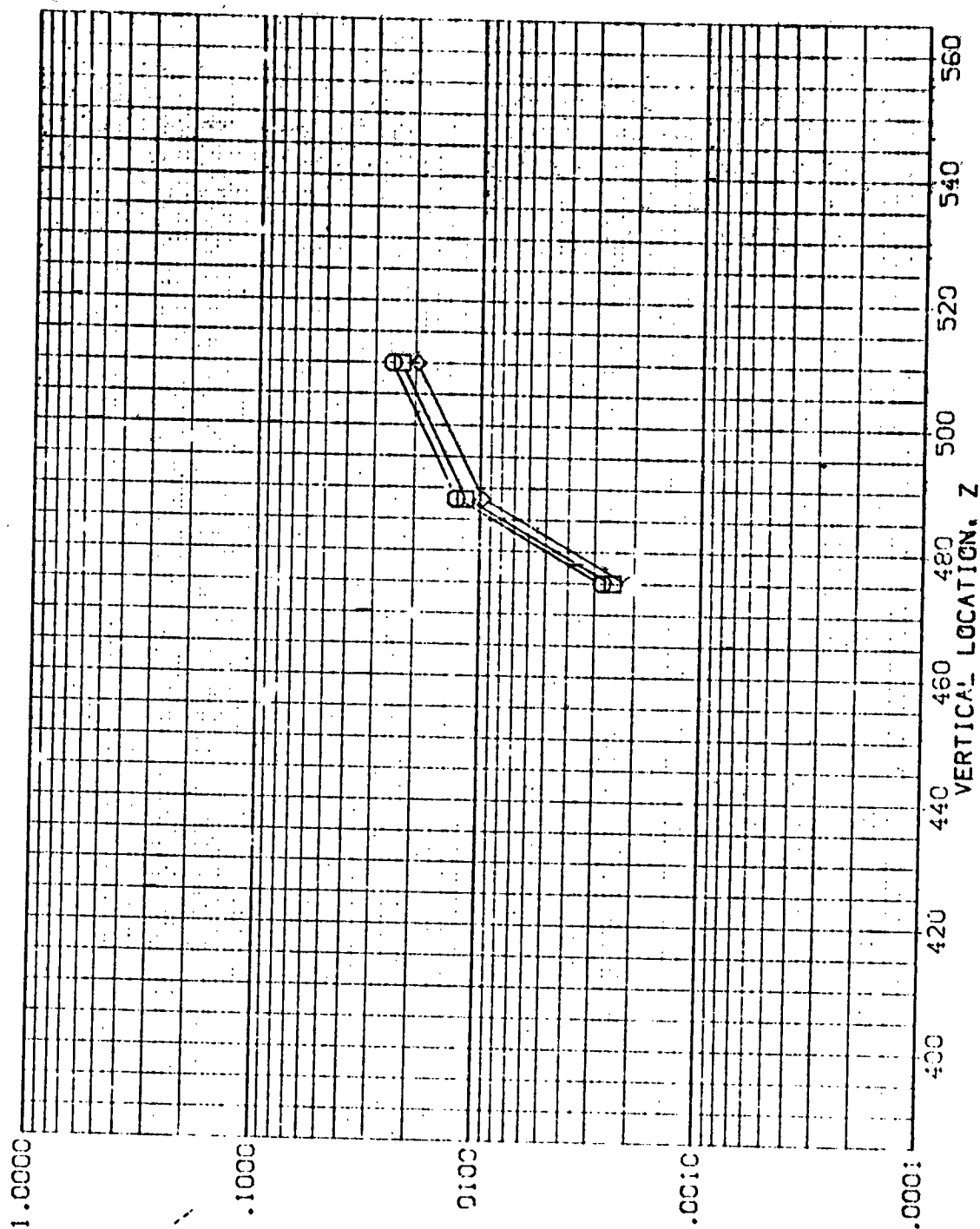


FIG. 14 0MS PODS, ORBITER IN PRESENCE OF THE TANK



AVES 3.5-195 1H28 01+T1 CMS PODS

(REV002)

PARAMETER VALUES  
 ALPHA 35.000  
 BETA 1.000  
 RV/L 1.000

PARAMETER VALUES  
 ALPHA 35.000  
 BETA 1.000  
 RV/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

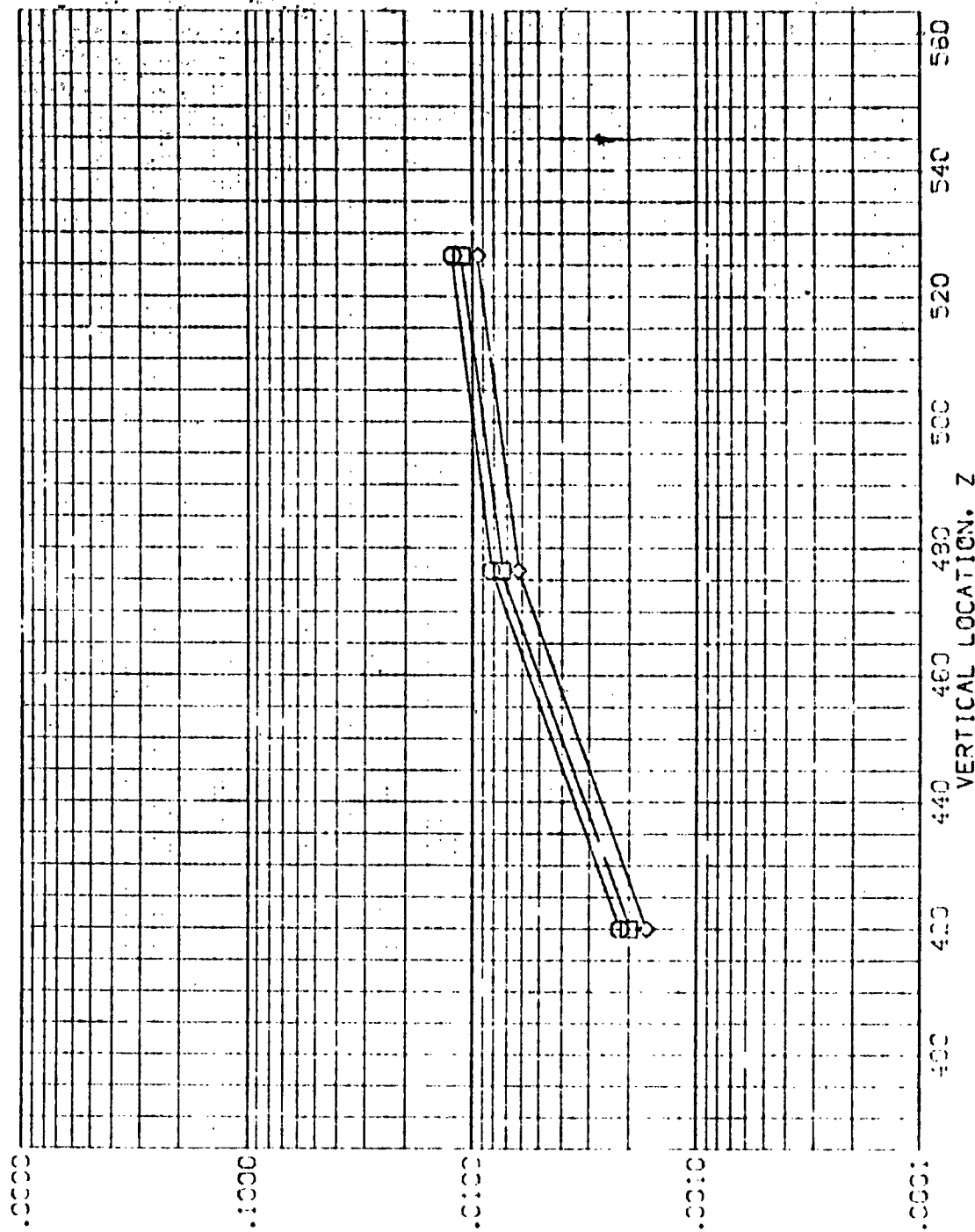


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 QMS PCDS

(REVC03)

S/VES- H<sub>0</sub>/H<sub>1</sub> K/L MACH  
 .850 .825 5.220  
 .900  
 1.000

PARAMETRIC VALUES  
 ALPHA 60.000 BETA .000  
 P<sub>0</sub>/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

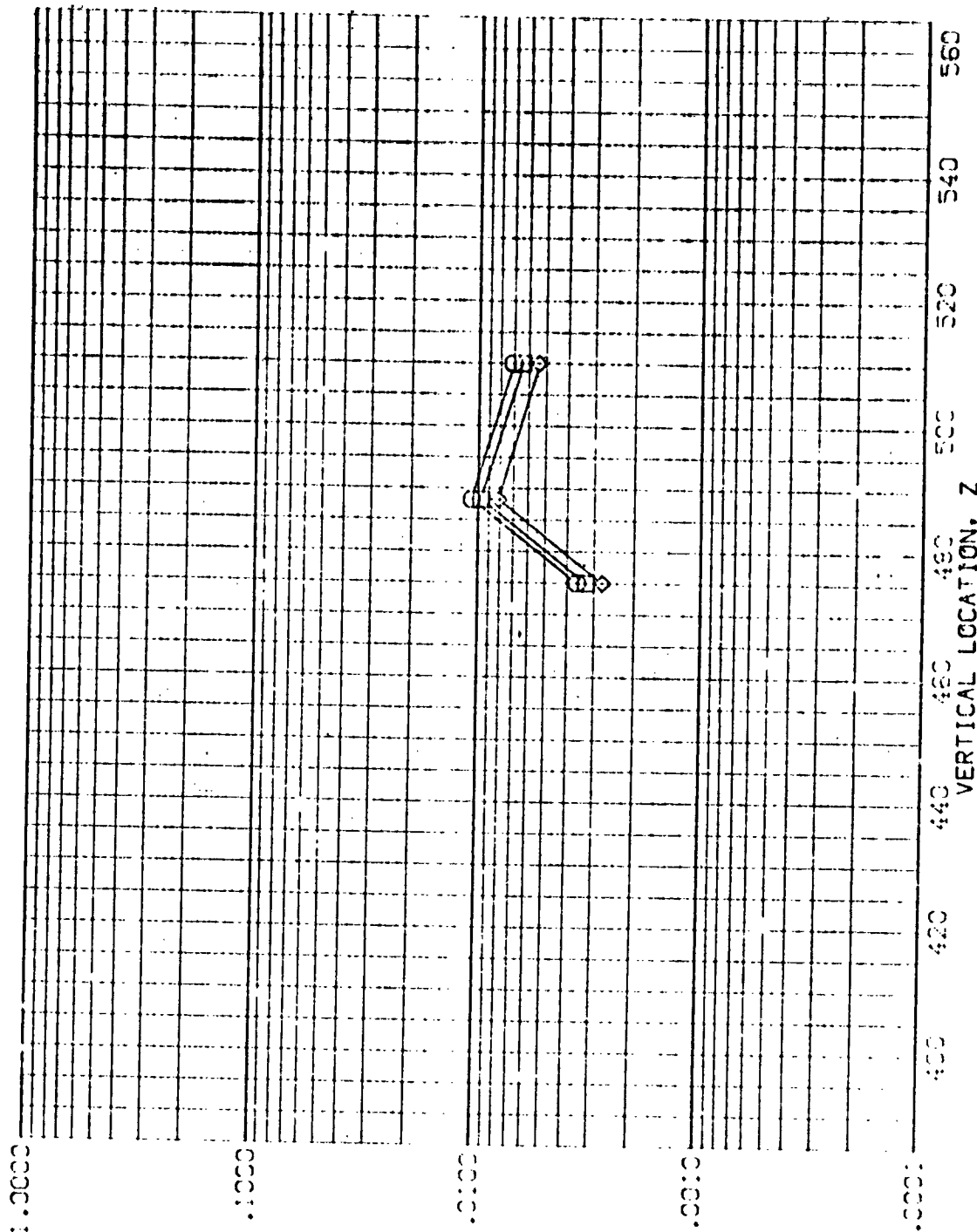


FIG. 14 QMS PCDS, ORBITER IN PRESENCE OF THE TANK

AVES 3.5-195 1428 01+T1 OMS PODS

151100030

SIUVEZ  
0.110  
0.000  
1.000

WAVELENGTH  
0.850  
0.900  
1.000

MACH  
5.220

PARAMETER VALUES  
ALPHA  
50.000  
BETA  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

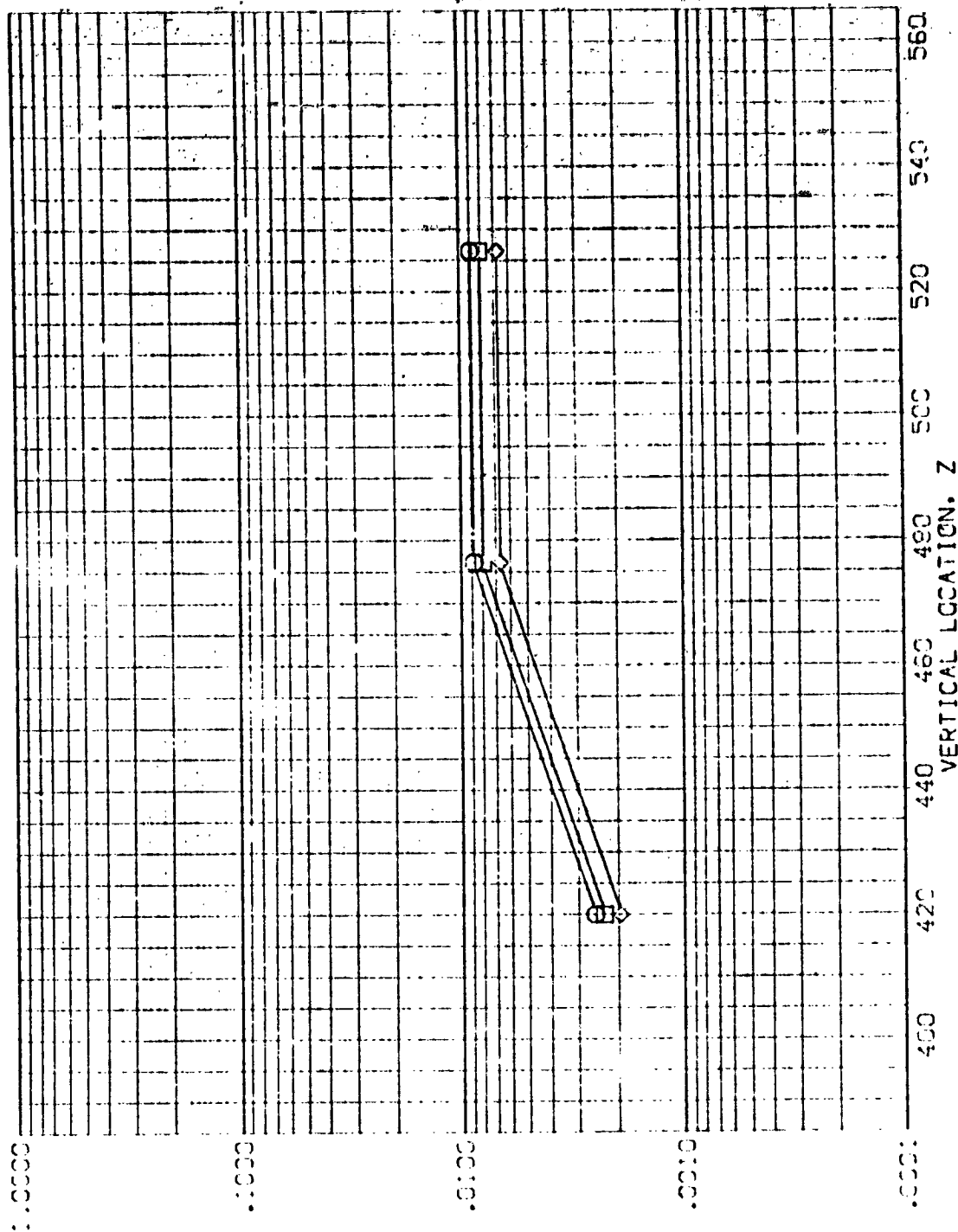


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

AVES 3.5-195 1-28 01-11 OVS PODS

(REVCC4)

SVESZ  
-0.000  
.850  
.900  
1.000

W/L MACH  
.925 5.213

PARAMETRIC VALUES  
ALPHA 90.000 BETA .000  
RVL 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

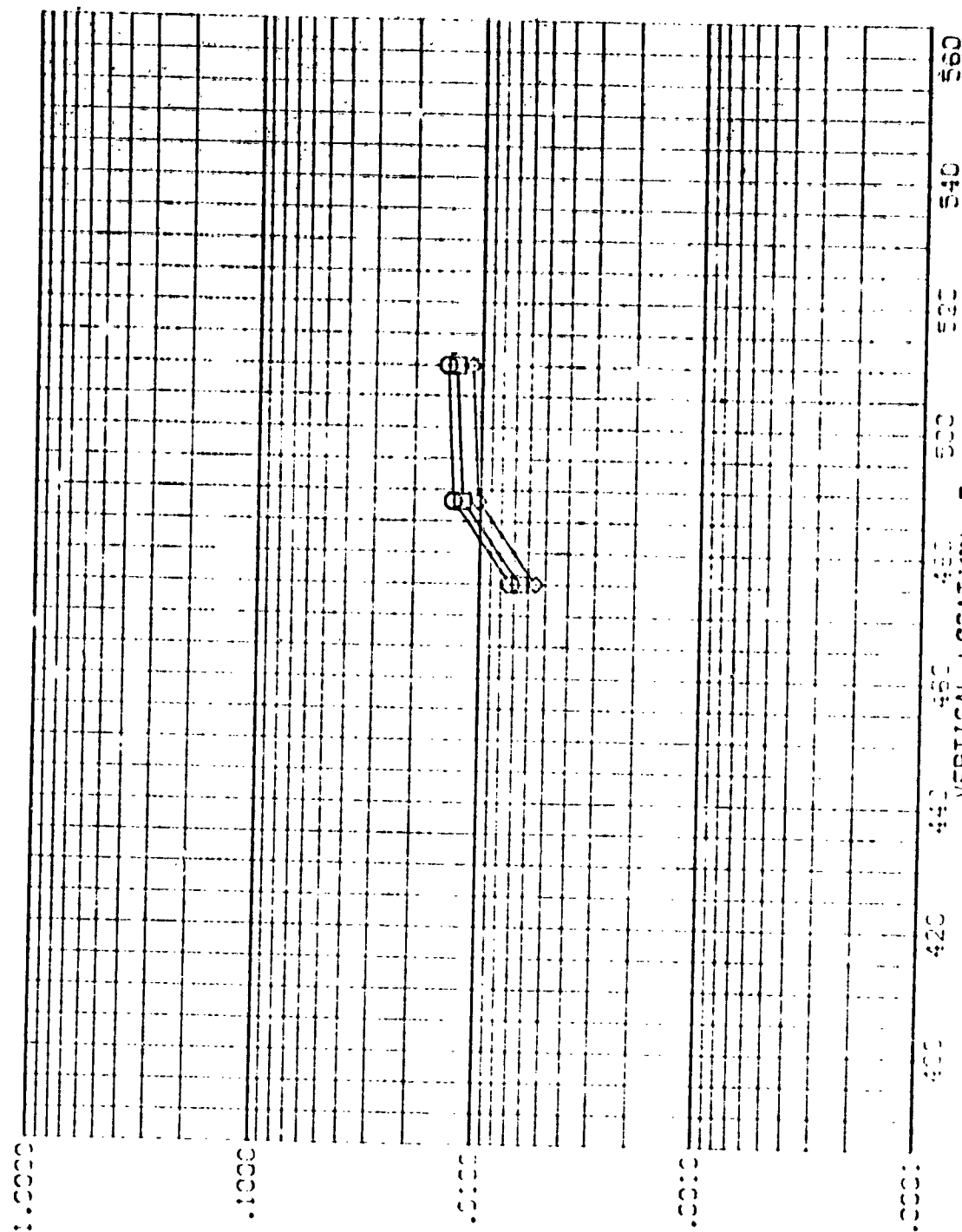


FIG. 14 OVS PODS, ORBITER IN PRESENCE OF THE TANK

The graph displays three data series, G1, G2, and G3, plotted against Time and Temperature. The x-axis is labeled 'TIME' and the y-axis is labeled 'TEMPERATURE'. G1 is represented by a solid line, G2 by a dashed line, and G3 by a dotted line. All three series show a similar trend, starting at a low temperature, rising to a peak, and then falling. G1 is consistently the highest, followed by G2, and then G3.

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REPRODUCIBILITY OF THE  
ORIGINAL PAGE IS POOR

AMES 2.5-125 1428 C1-11 DWS 8303

(FE.005)

1.000  
 0.800  
 0.600  
 0.400  
 0.200  
 0.000

PARAMETRIC VALUES  
 ALPHA 1.000  
 BETA 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

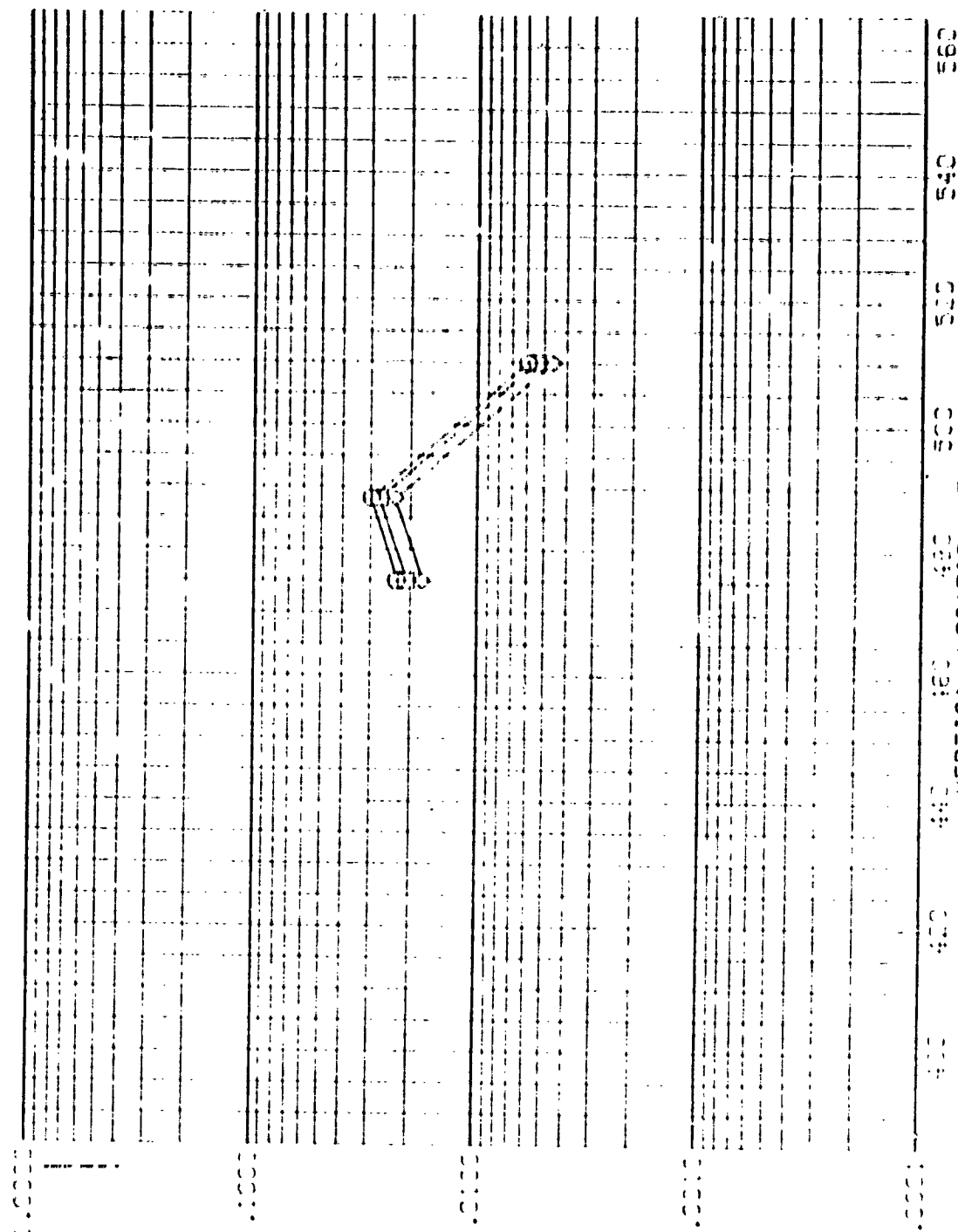


FIG. 14 CWS 8303, CRITERION IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01-11 QMS PODS

(REV005)

SYMBOL  
 ◻  
 ◻  
 ◻

HAW/HT  
 .850  
 .900  
 1.000

MACH  
 5.230

W/L  
 .900

PARAMETER VALUES  
 ALPHA  
 120.000  
 BETA  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

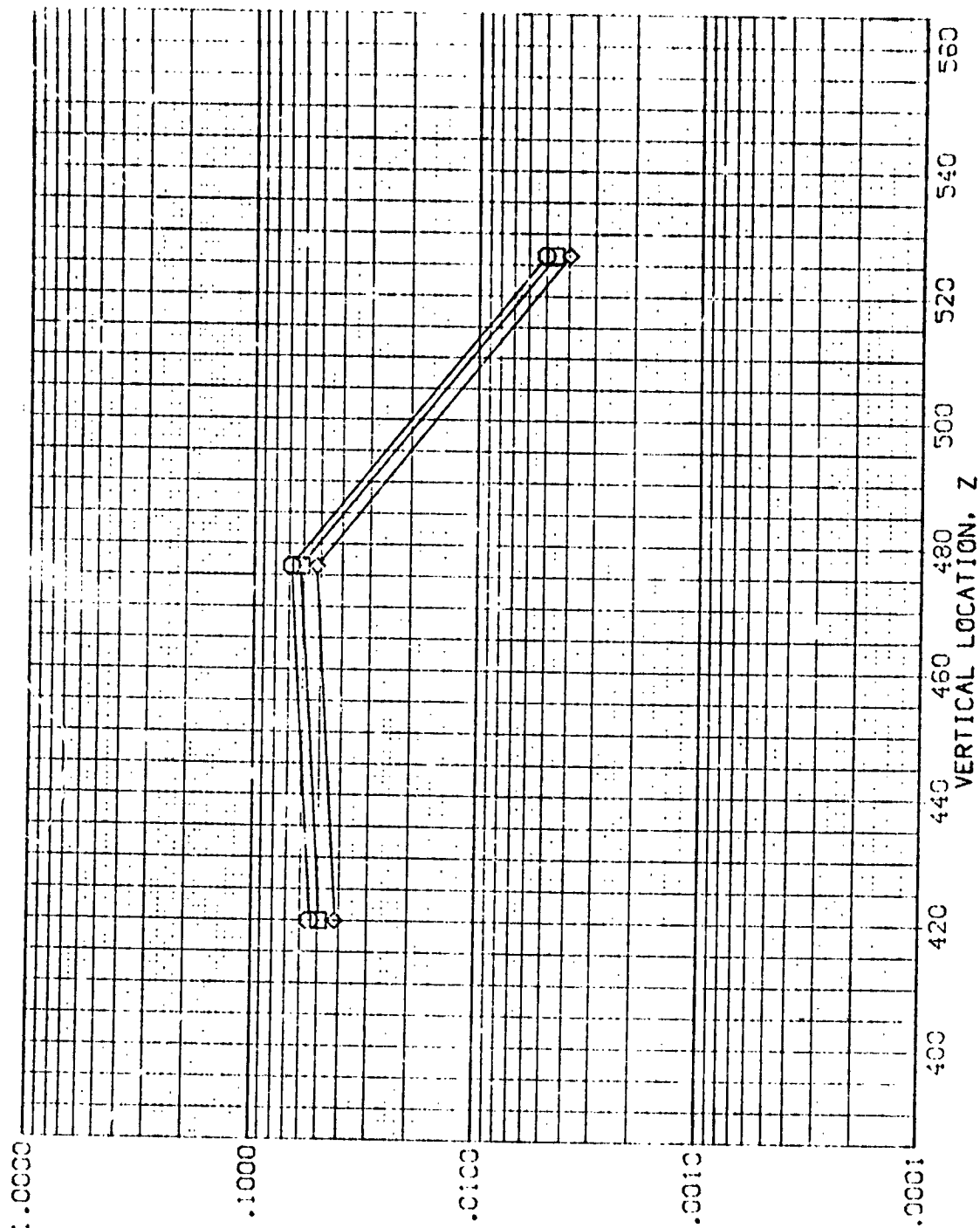


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

C9

AMES 3.5-195 IH28 G1+T1 GMS PODS

(REVC06)

SWSC	MAW/HT	X/L	MACH	PARAMETRIC VALUES	
0.000	.850	.625	5.220	ALPHA	-126.000
0.000	.300			RV/L	1.000
1.000				BETA	.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

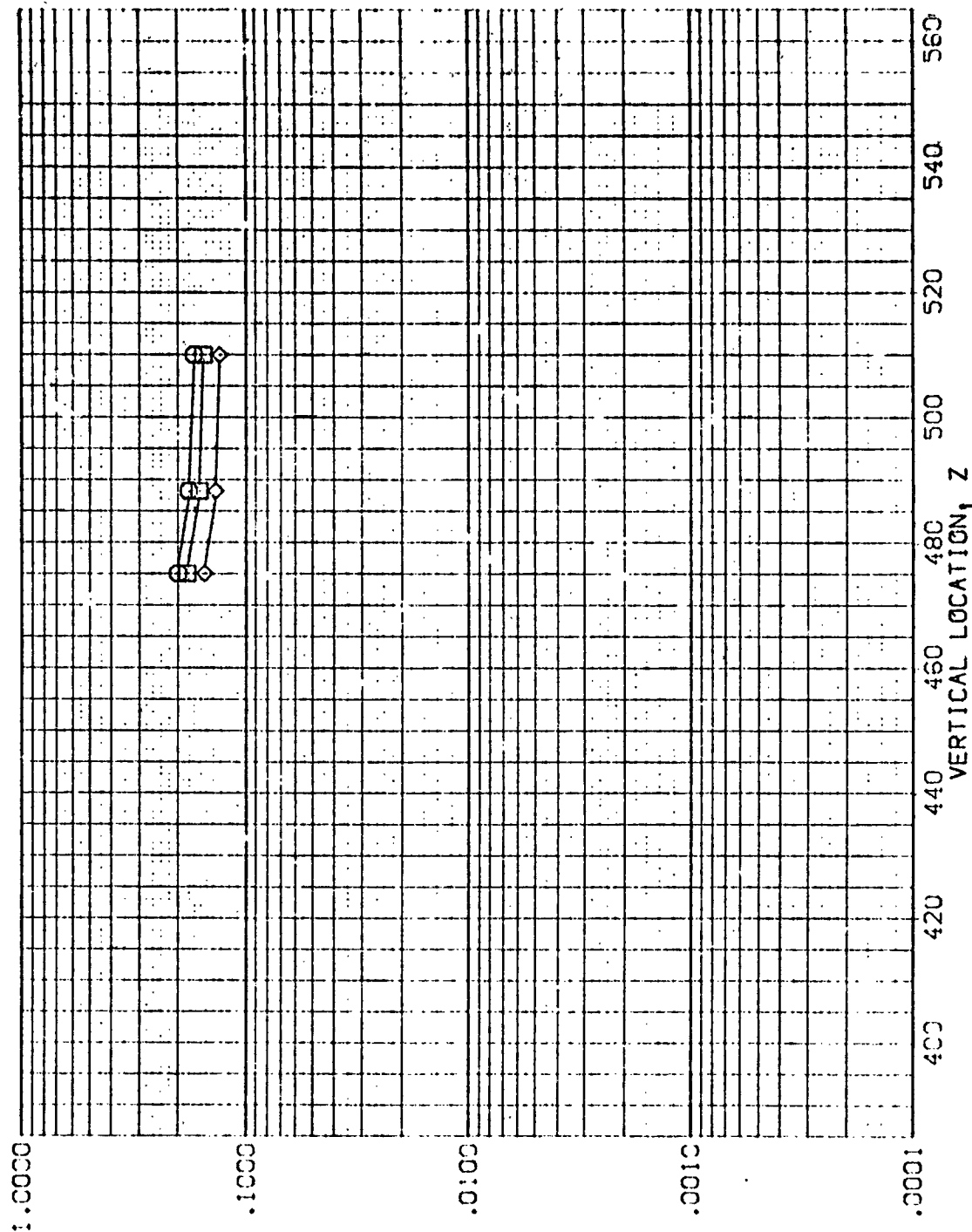


FIG. 14 GMS PODS, ORBITER IN PRESENCE OF THE TANK



AYES 3.5-195 IH28 01+T1 0MS PODS

(REV006)

PARAMETRIC VALUES  
ALPHA -120.000 BETA .000  
RN/L 1.000

SYMBOL H/HREF X/L MACH  
◇ .900 5.220  
□ .900  
□ 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

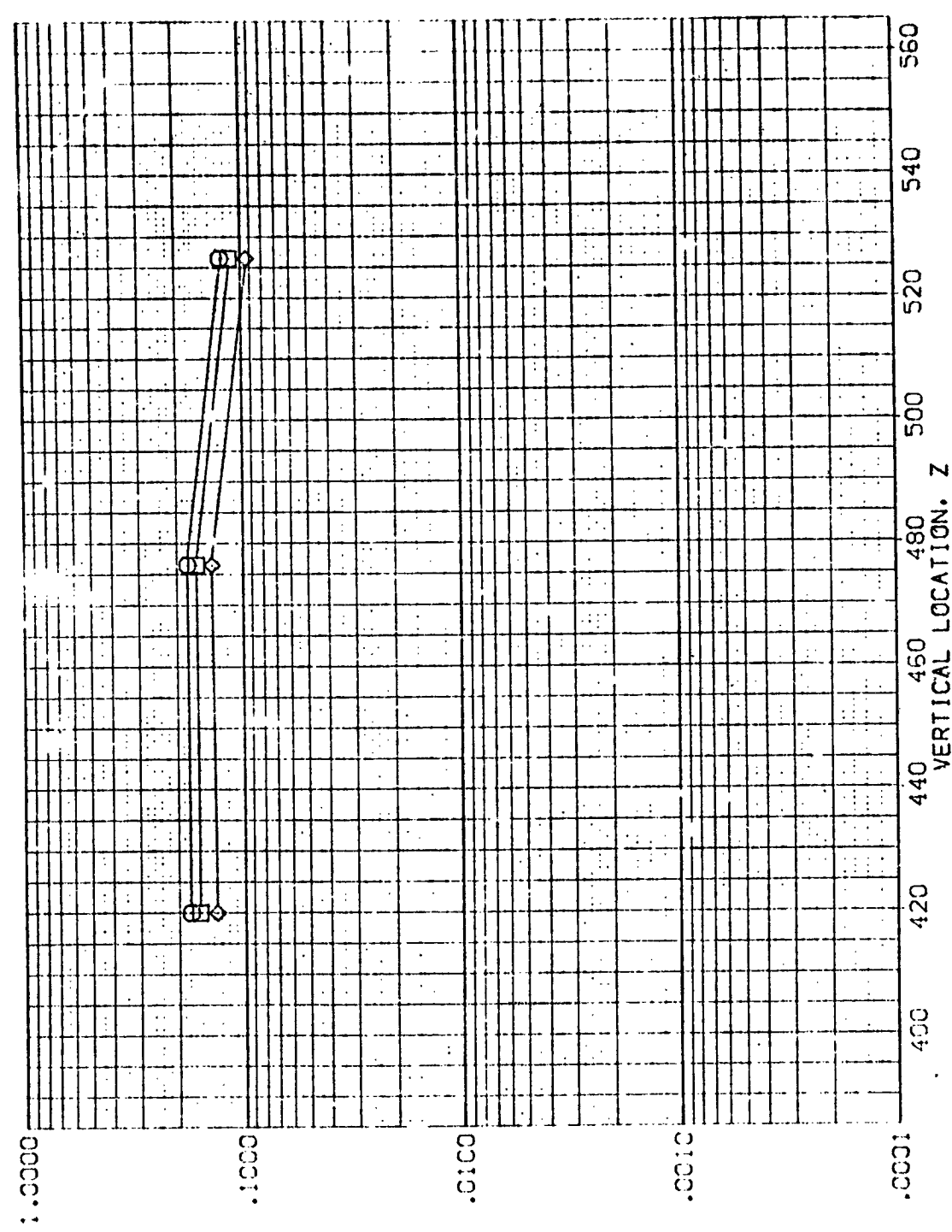


FIG. 14 7MS PODS, ORBITER IN PRESENCE OF THE TANK

(REVC07)

PARAMETRIC VALUES

ALPHA -90.000 BETA .000

RN/L 1.000

AMES 3.5-195 IH28 01+T1 OMS PODS

SV302 HAW/HT X/L MACH

.850 .825 5.219

.900

1.000

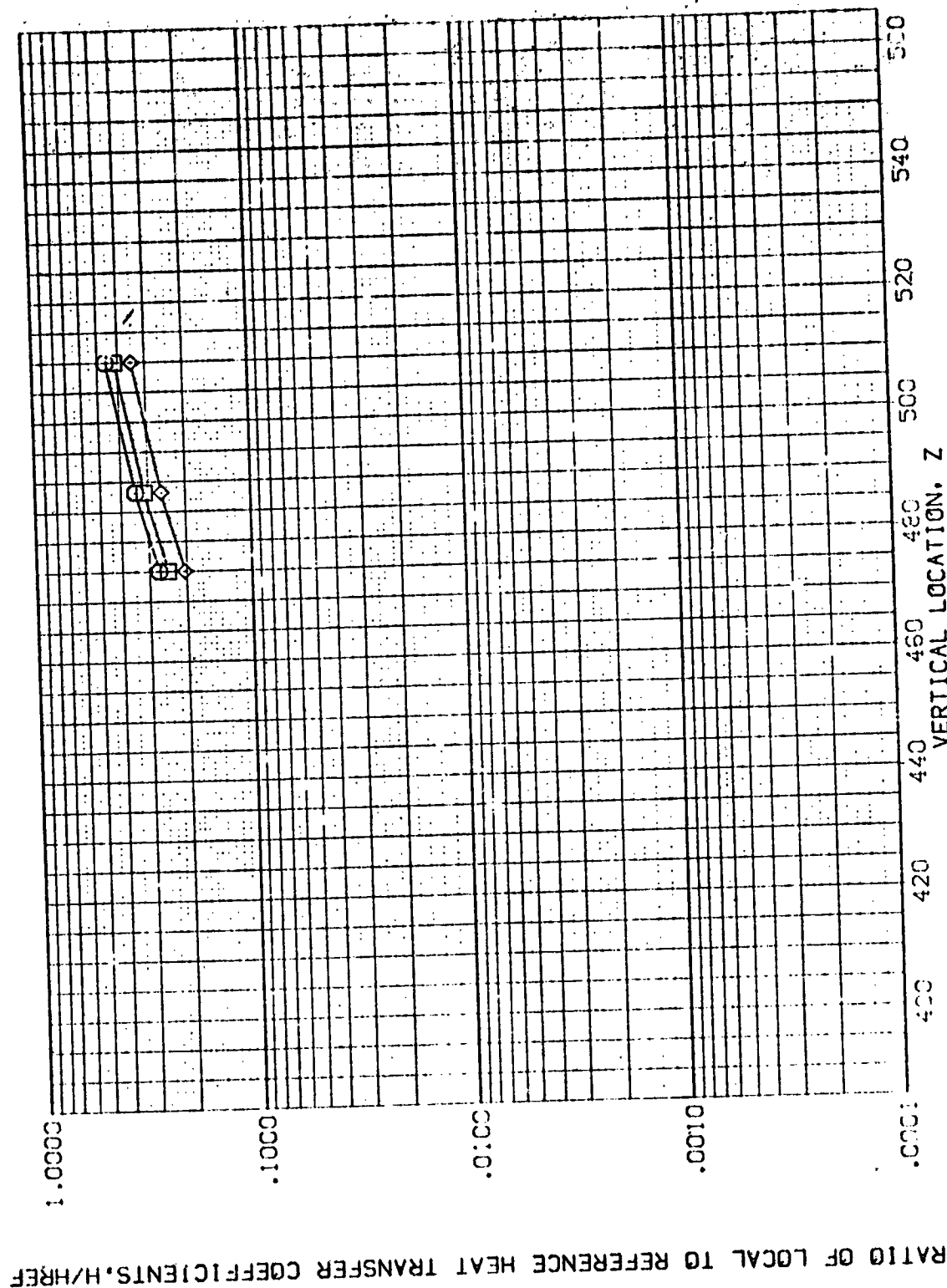


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 QMS PODS

(REV007)

SYMBOL HA/H\* X/L MACH  
 □ .950 .900 5.219  
 ◇ .900 .900 5.219  
 △ 1.000 1.000 5.219

PARAMETER VALUES  
 ALPHA -30.000  
 BETA 1.000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

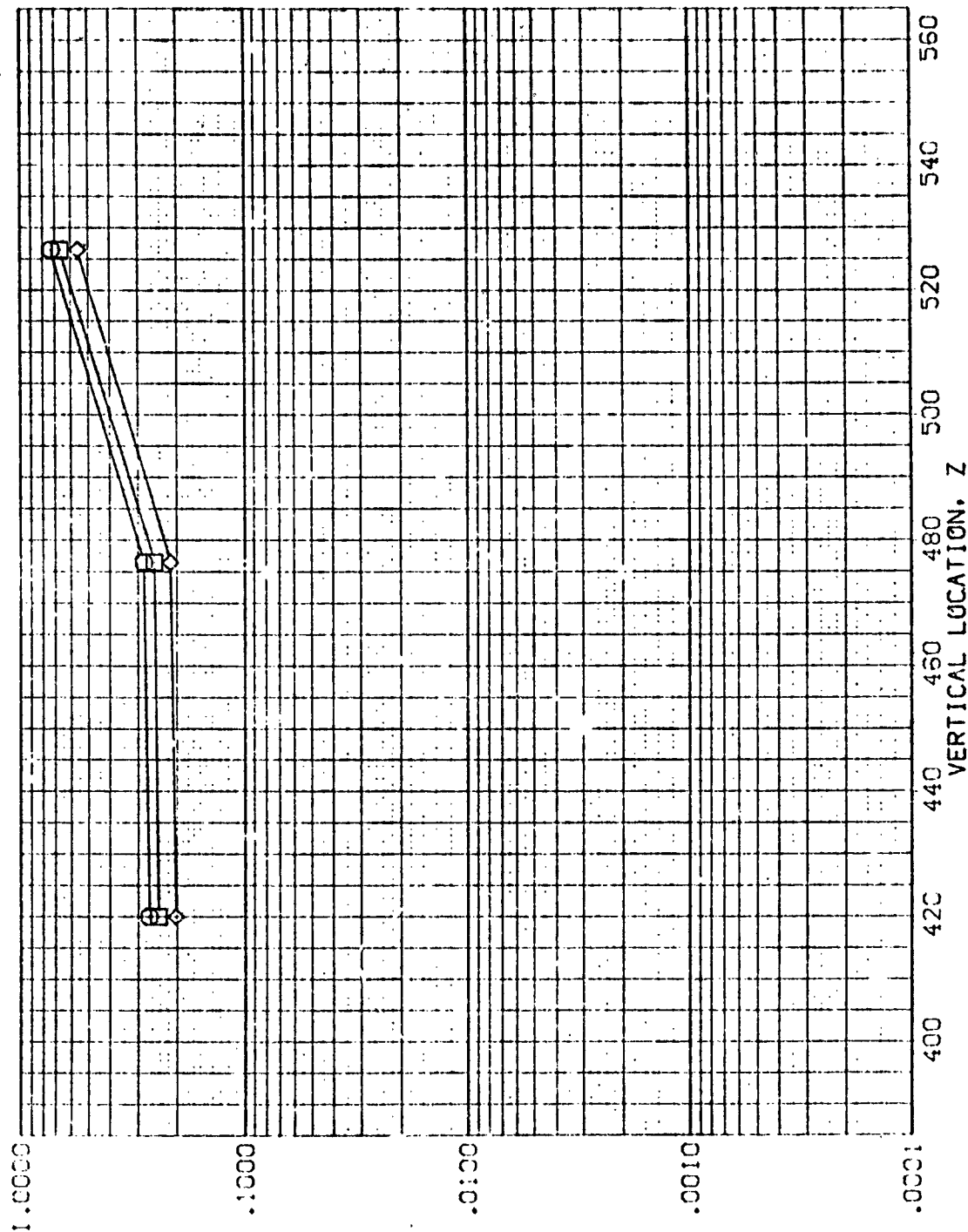


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 1H28 01+T1 CMS PODS

(REV008)

PARAMETRIC VALUES  
ALPHA -60.000 BETA .000  
RN/L 1.000

MAW/WT X/L MACH  
.850 .925 5.220  
.900  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

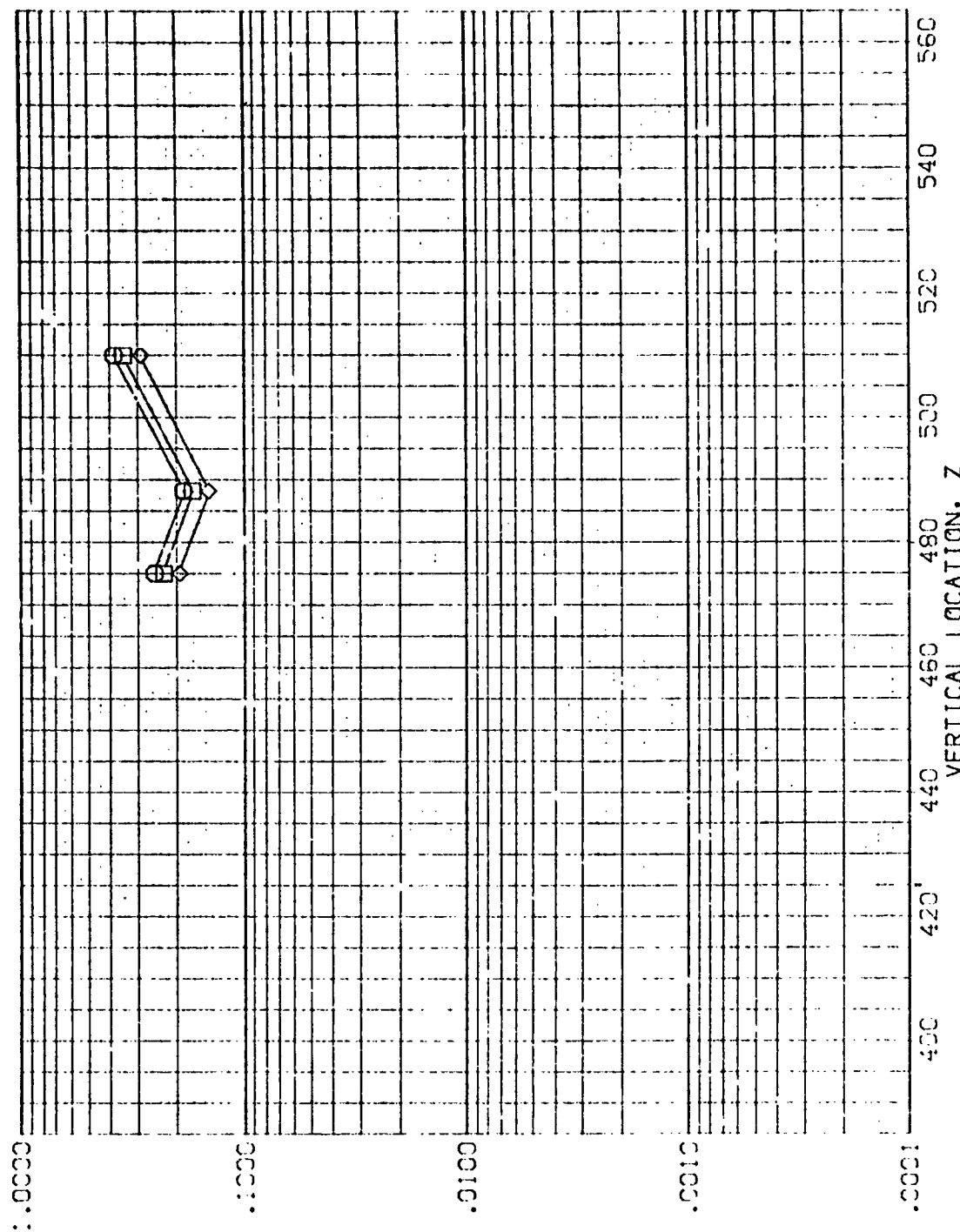


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

AVES 2.5-195 1-28 01-T1 QMS PODS

SPED-  
MACH  
X-  
MACH  
5.220

0.850  
0.900  
0.950  
1.000

BASELINE  
ALPHA  
RWL  
1.000  
1.000  
1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

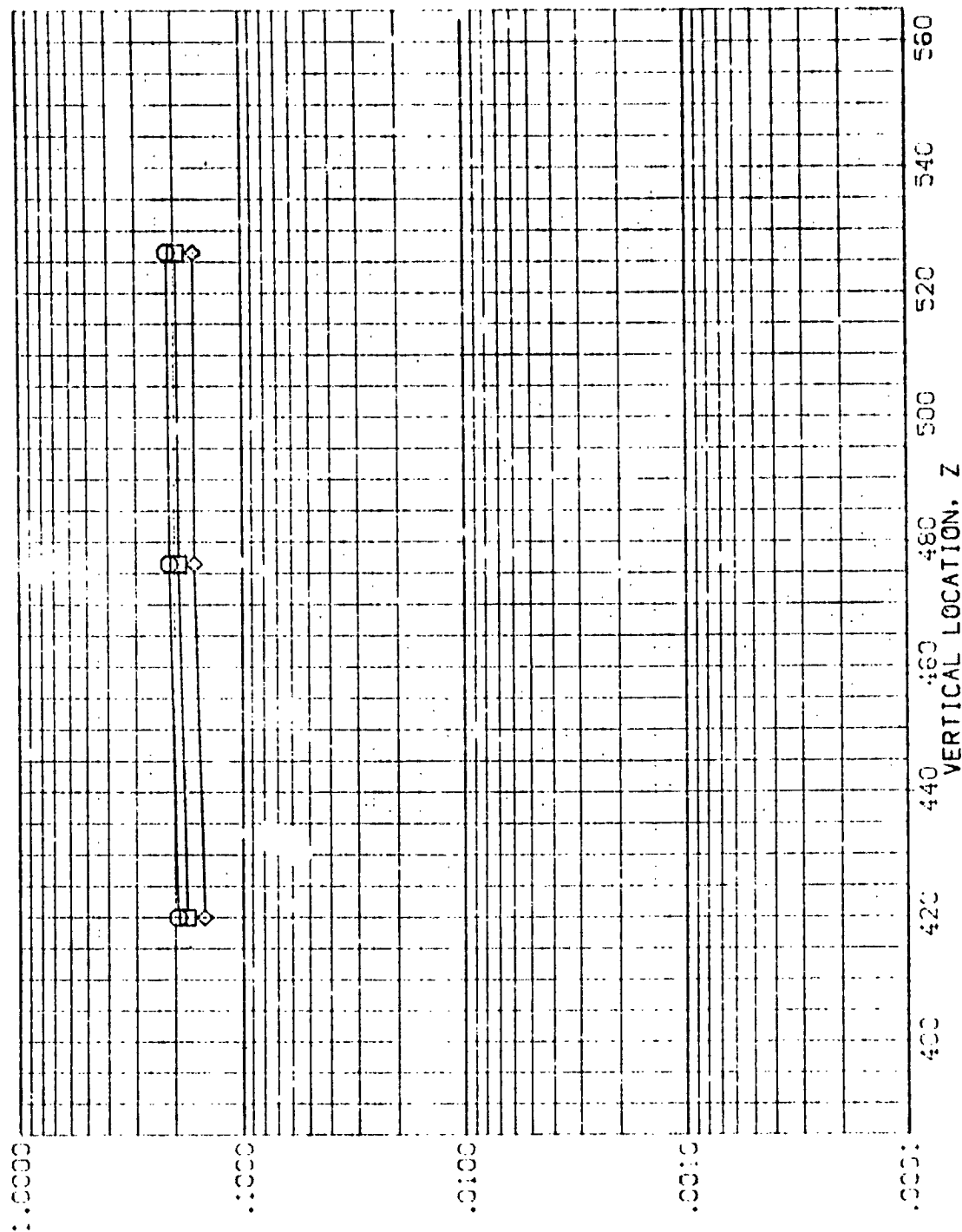


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 01+T1 QMS PODS

(REVC09)

SYSC  
H/WNT  
X/L  
MACH

.825  
5.220

PARAMETRIC VALUES  
ALPHA  
RV/L  
BETA  
1.000  
.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

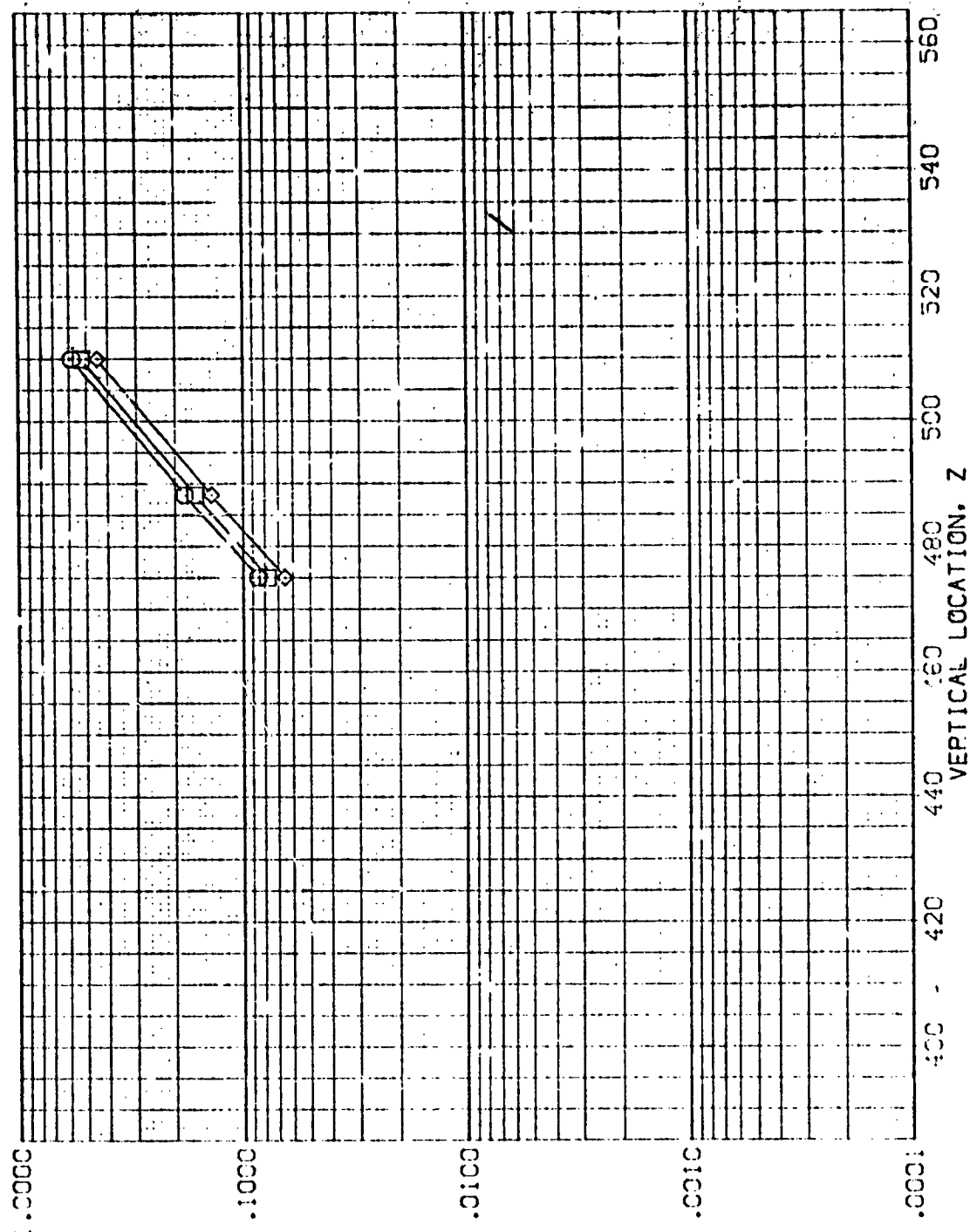


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

AMES 3.5-195 IH28 C1+T1 QMS PODS

(REV. 10-69)

S/WG 850  
 850  
 900  
 1.000  
 MACH 5.220  
 X/L .900

ALPHA  
R/L

1.000  
 1.000  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

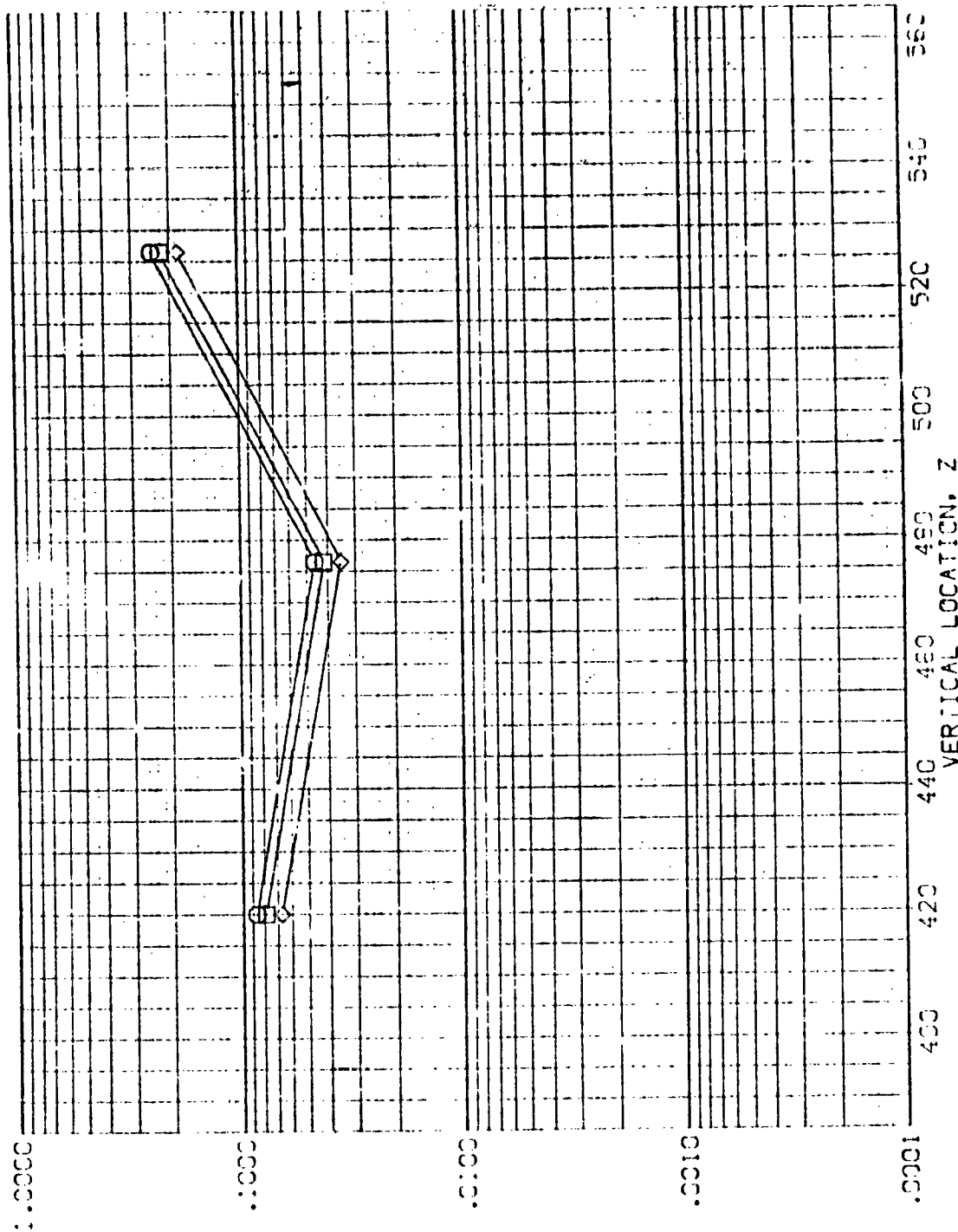


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

SECRET

HA 0.14	1/2	5.299
.850	.925	
.800		
.600		
.400		

PARAMETRIC VALUES	
ALPHA	BETA
60.000	
RM/L	4.000

000-

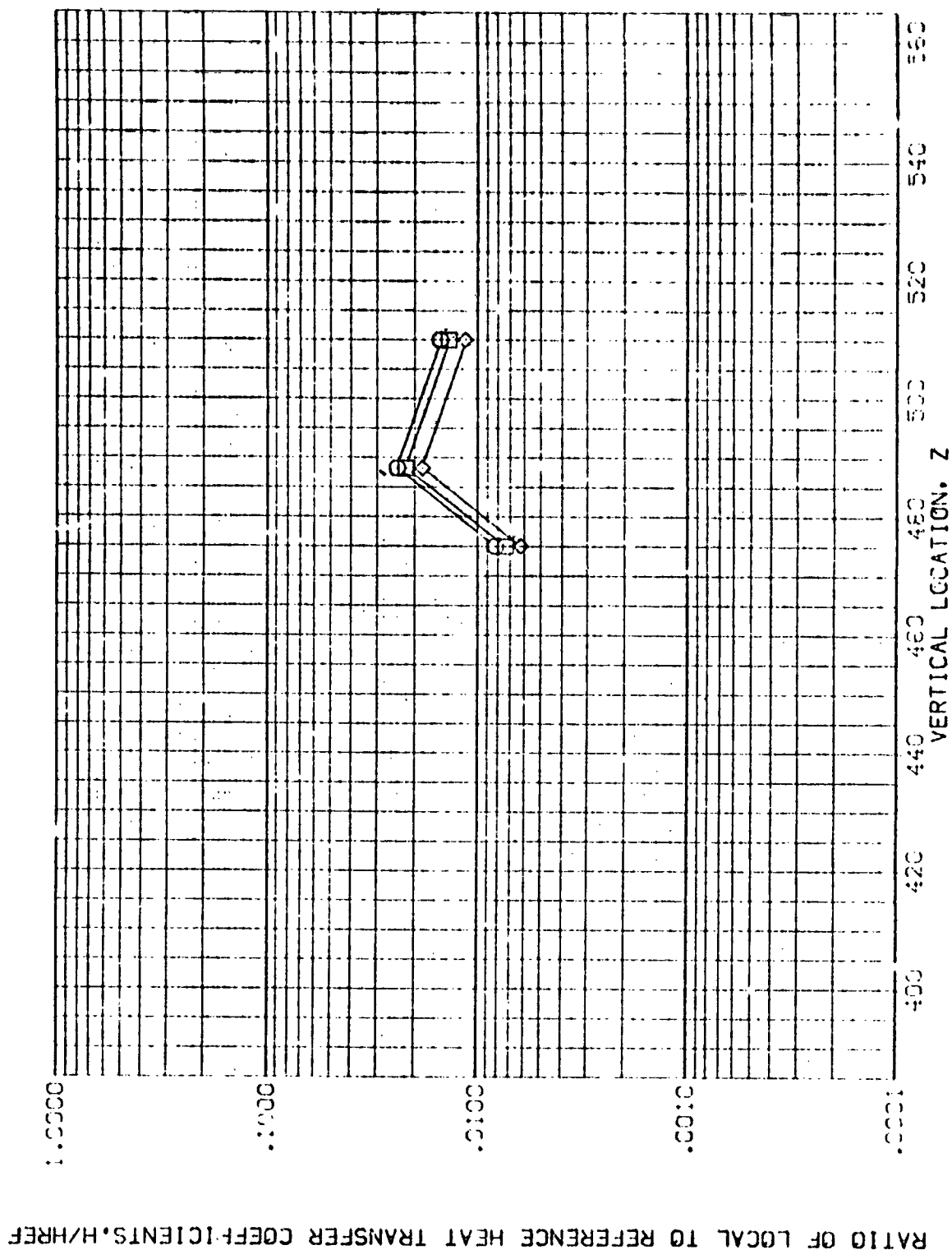
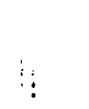


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK





ANES 3.5-195 1428 01+T1 QMS PODS

(REV:0110)

PARAMETRIC VALUES  
 ALPHA 30.000  
 BETA 4.000  
 RAYL 1.000

STATS: HAW/RT 1/1- MAC- 5.300  
 .850  
 .900  
 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

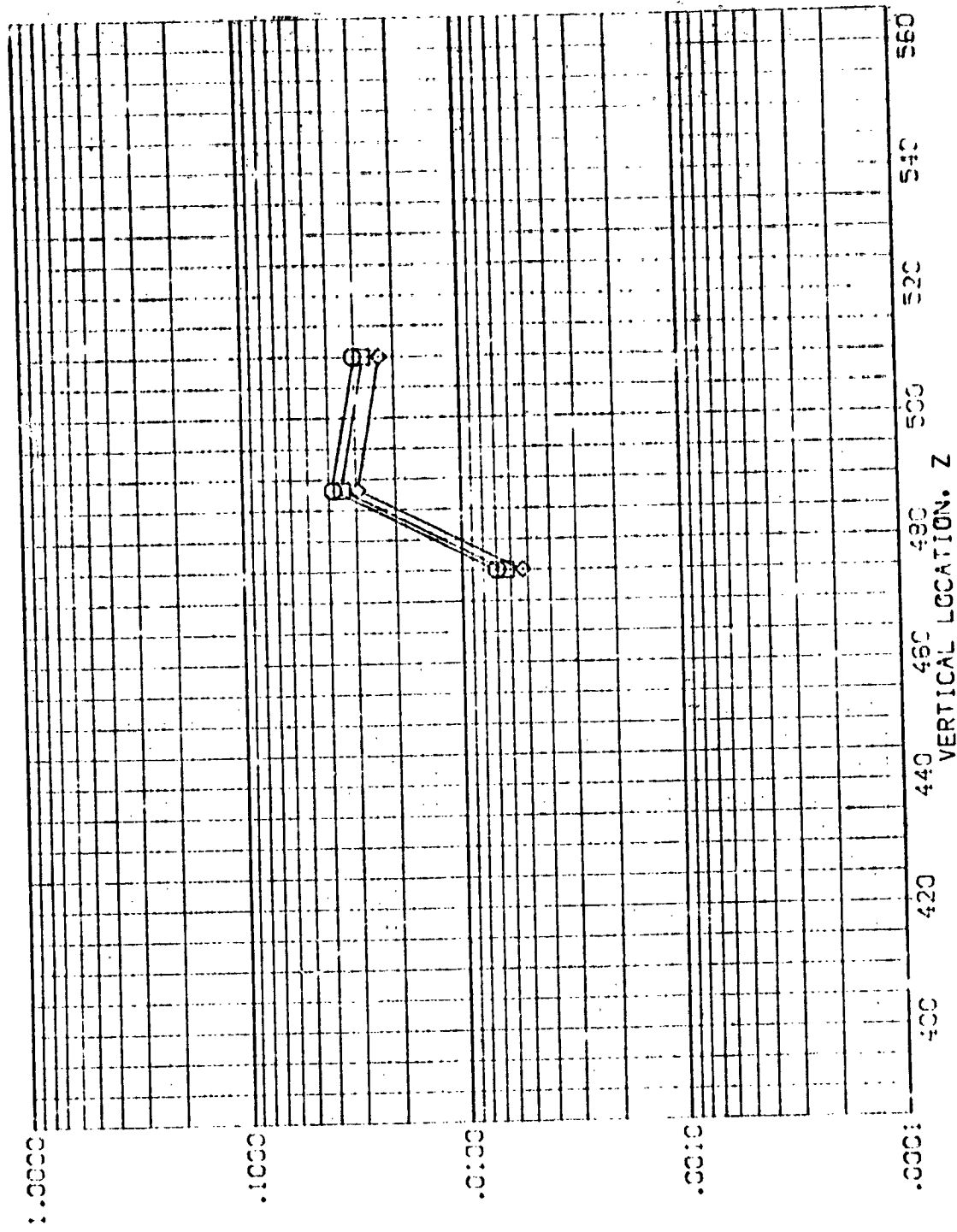


FIG. 14 QMS PODS, ORBITER IN PRESENCE OF THE TANK

WES 3.5-100 1-12 01-11 703 1113

WACH 1000 5.000

WACH 1000 5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

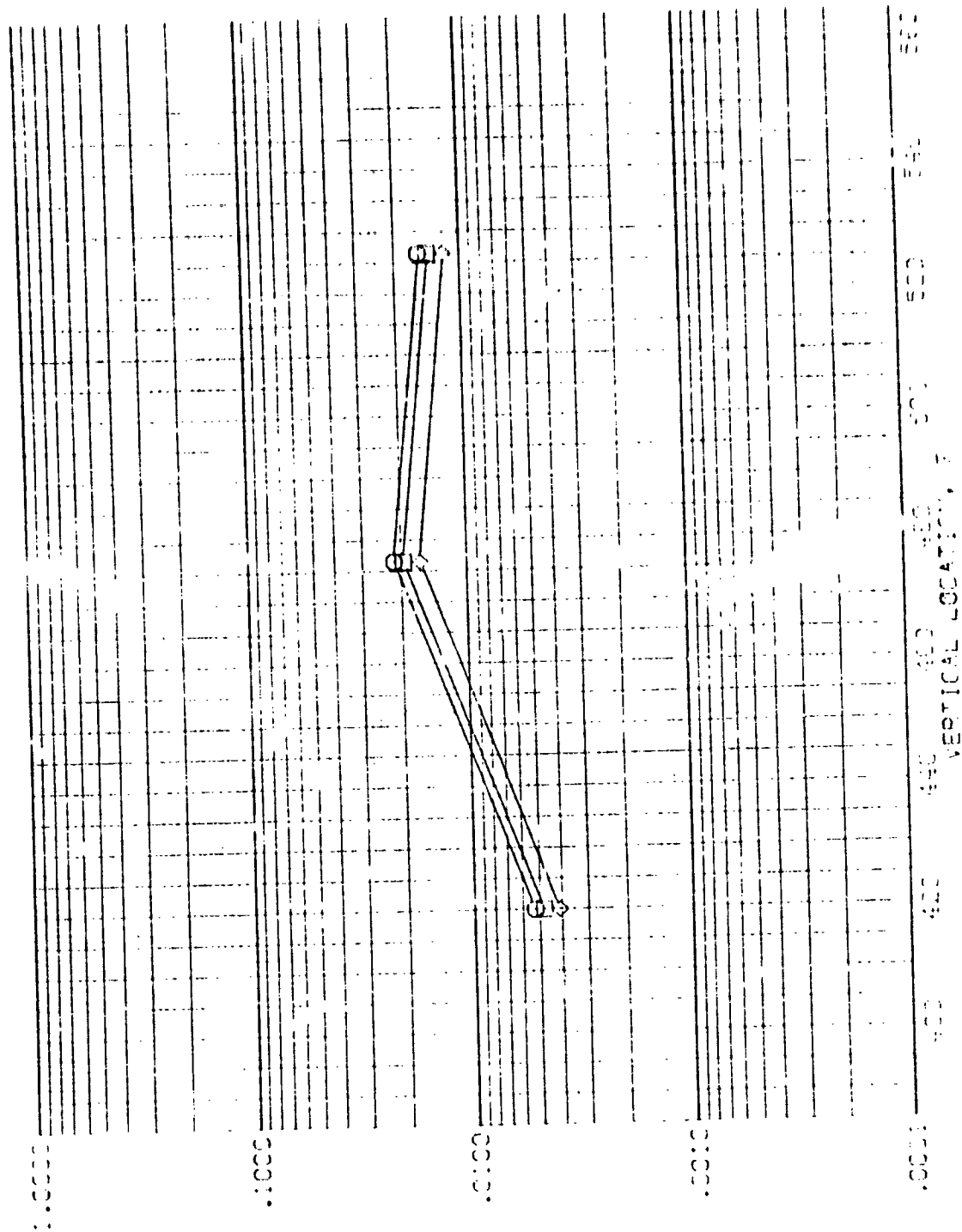


FIG. 14 0MS PCDS, ORBITER IN PRESENCE OF D-TM

AYES 3.5-195 1H28 01+11 OMS PODS

(REVC12)

SVESZ  
HAY, HT  
X/L  
VACH  
1.950  
.825  
5.220  
1.000

PARAMETRIC VALUES  
ALPHA  
30.000  
BETA  
1.000  
-5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

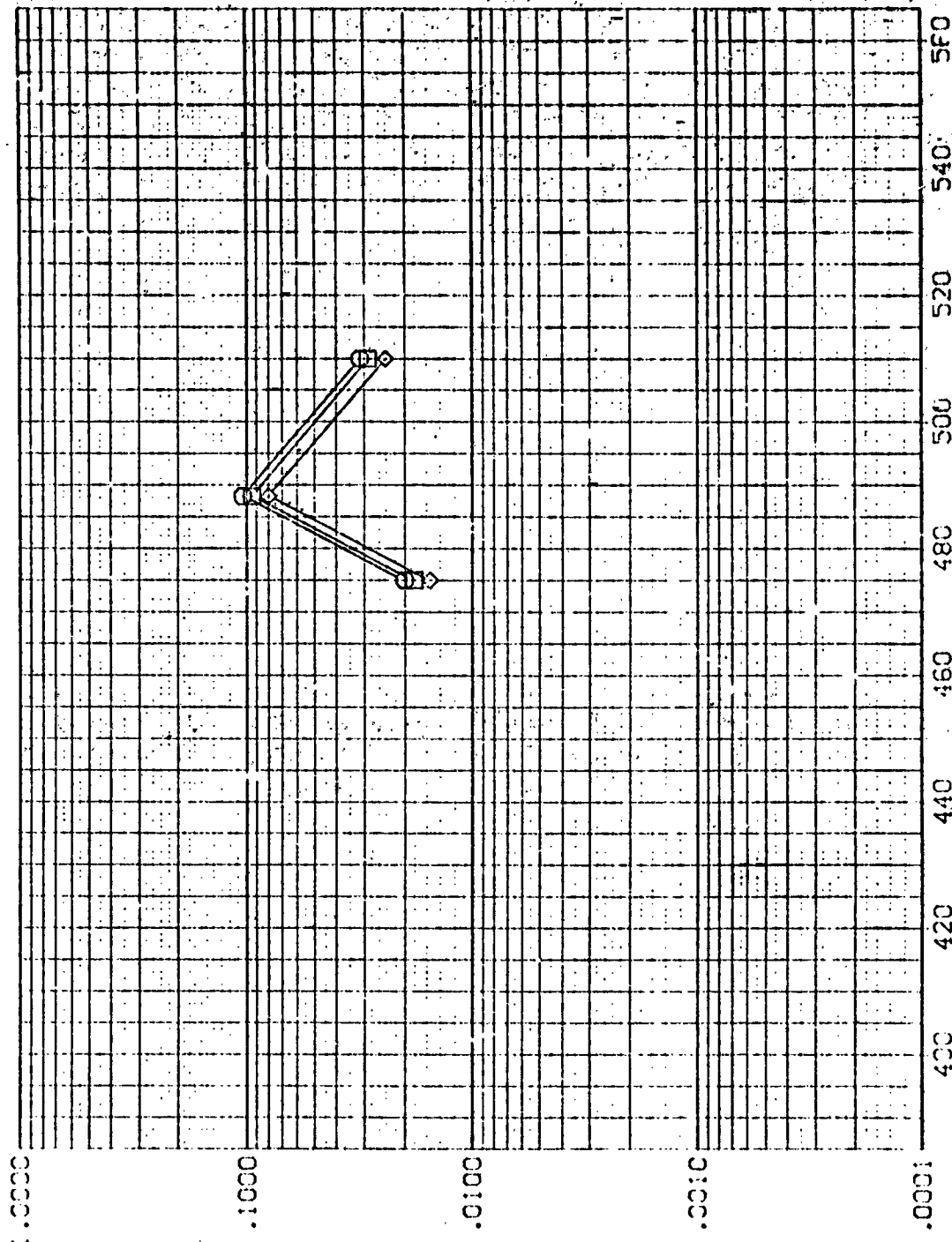


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

AYES 3.5-195 1H28 01+T1 OMS PODS

(REV C12)

SYMSC  
 ◇  
 □  
 ○

HAW/HT X/L MACH  
 .850 .900 5.220  
 .900  
 1.000

PARAMETER VALUES  
 ALPHA 30.000 BETA -5.000  
 RN/L 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

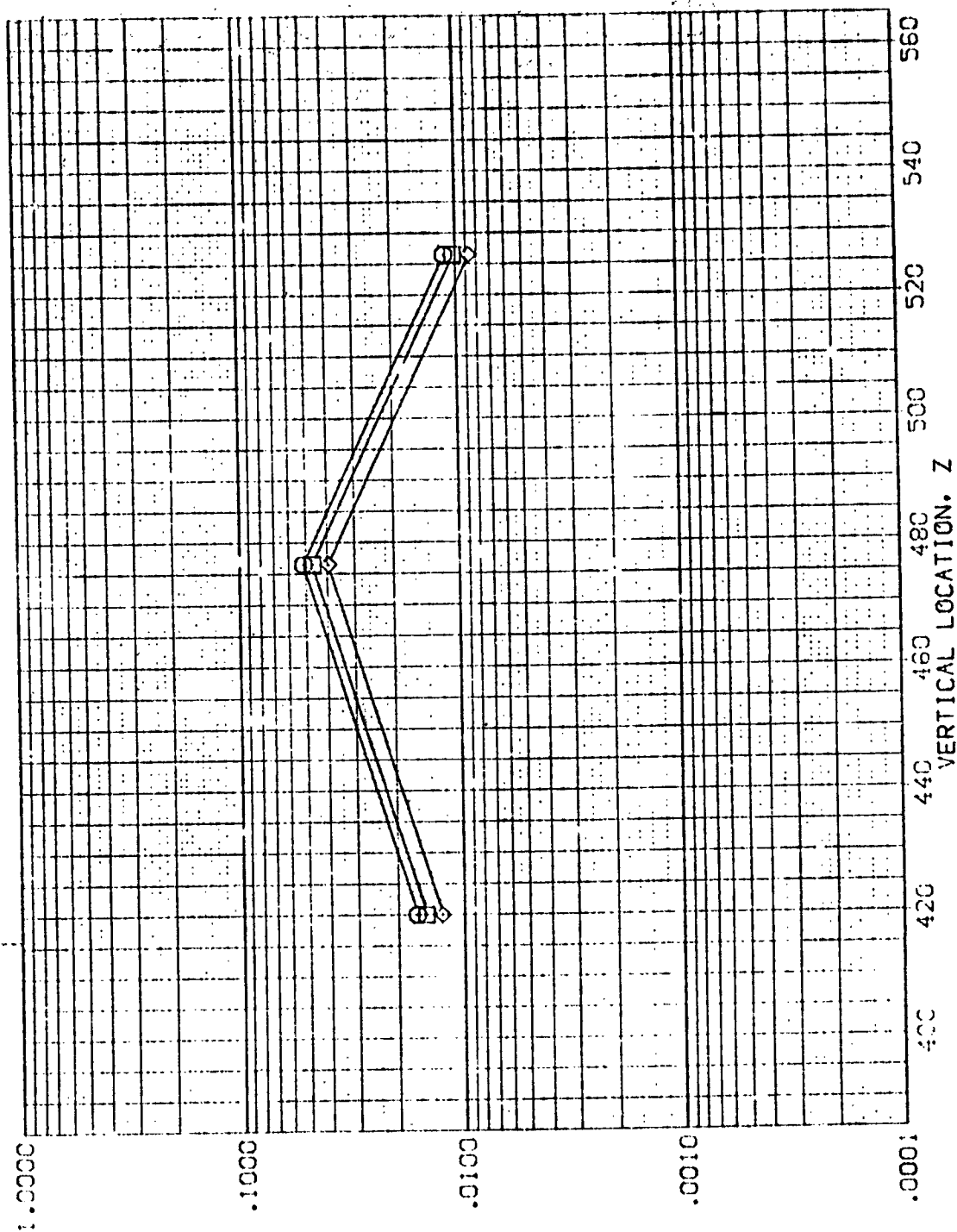


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

DATA SET SYMBOL    CONFIGURATION DESCRIPTION

(REV001)	AMES 3.5-195 1428 01+11 C/S	PODS
(REV002)	AMES 3.5-195 1428 01+11 C/S	PODS
(REV003)	AMES 3.5-195 1428 01+11 C/S	PODS
(REV004)	AMES 3.5-195 1428 01+11 C/S	PODS
(REV005)	AMES 3.5-195 1428 01+11 C/S	PODS

ALPHA    BETA    RM/L

.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

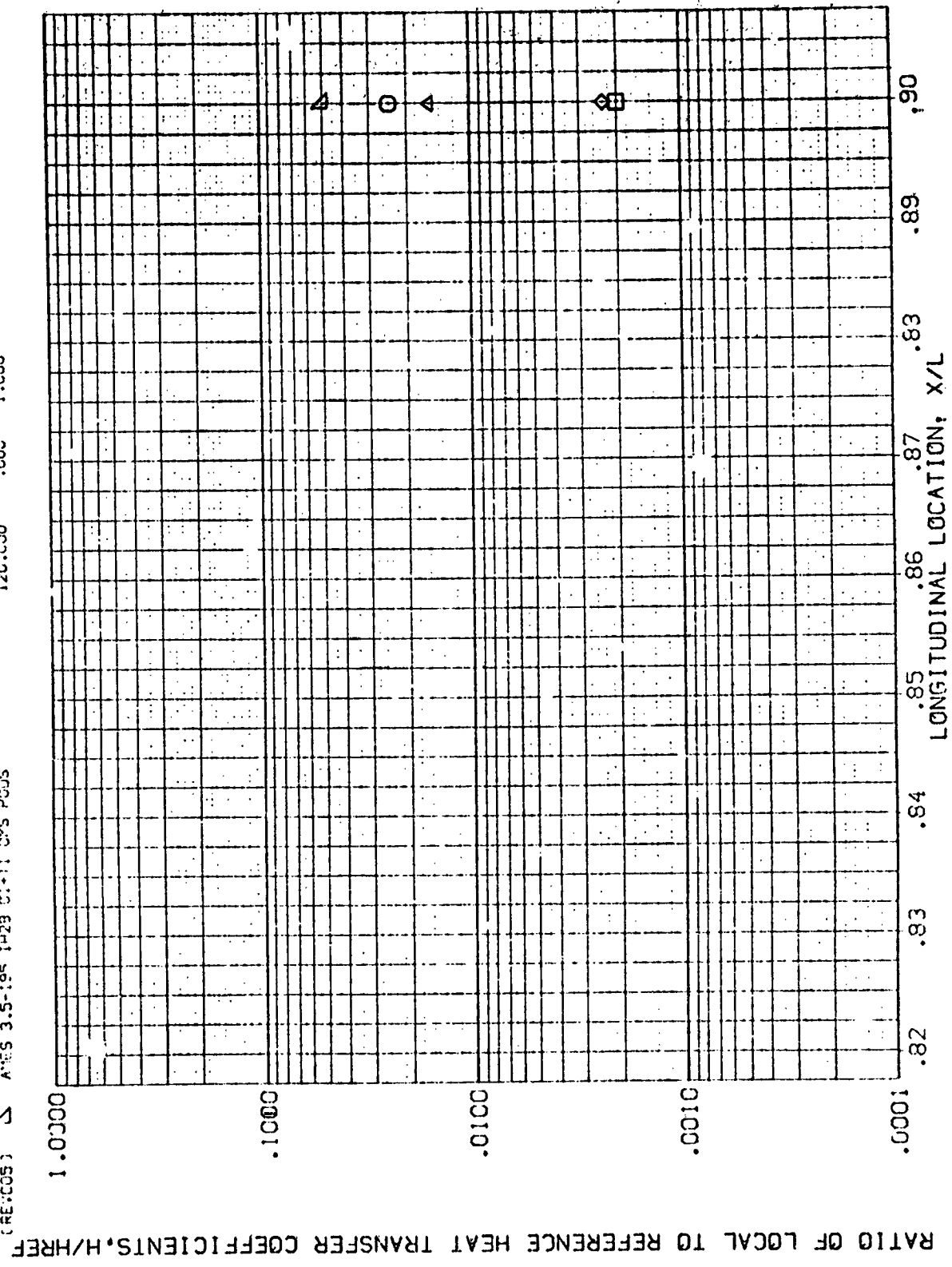


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

MACH = 5.200    HAW/HIE = .900    Z = 420.000

LONGITUDINAL LOCATION, X/L

Longitudinal Location, X/L	Y/L (approximate)
0.825	0.000
0.830	0.000
0.835	0.000
0.840	0.000
0.845	0.000
0.850	0.000
0.855	0.000
0.860	0.000
0.865	0.000
0.870	0.000
0.875	0.000
0.880	0.000
0.885	0.000
0.890	0.000
0.895	0.000

FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

$$\begin{aligned} \text{P10: } & \text{if } \text{one}(\text{posy} \text{ and } \text{negx}) \\ & \text{mach} = 5.333 \quad \text{--AW/WT} = .900 \quad Z = 475.000 \end{aligned}$$

ALPHA	BETA	RIV/L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
20.000	.000	1.000

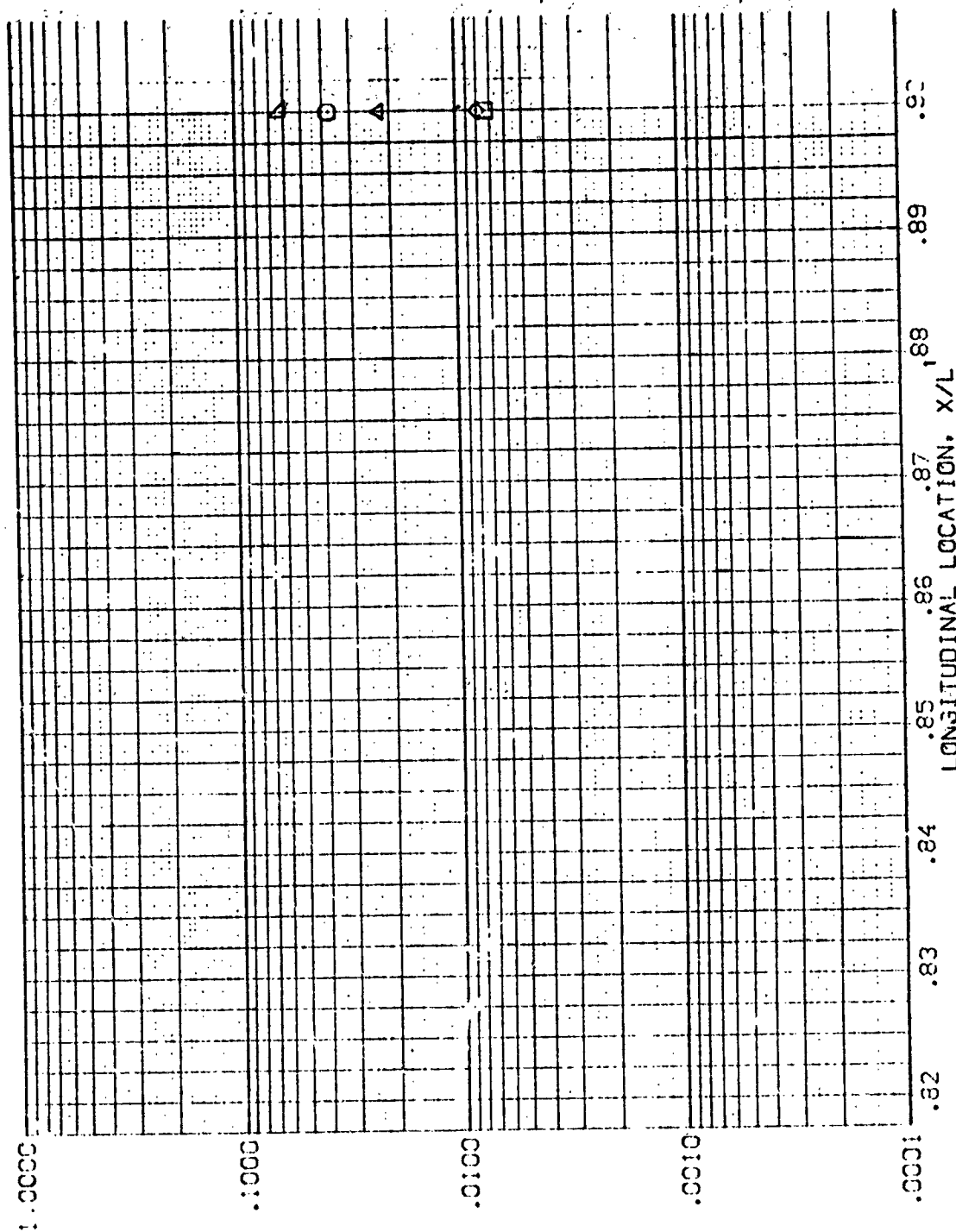


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

$$5.329 \quad \text{HAW/HT} = .900 \quad Z = 476.860$$



1.0000  
:000  
:0100  
:0010  
:0001

0.82 0.83 0.84 0.85 0.86 0.87 0.88 0.89 0.90

LONGITUDINAL LOCATION, X/L

ALPHA	BETA	GAMMA
.000	.000	.000
30.000	.000	.000
60.000	.000	.000
120.000	.000	.000

PAGE 748

$$v_{\text{eff}} = 5.300 \quad \text{HAW/HI} = .900 \quad Z = 488.300$$

REF ID: A66081

ALPHA	PETA	RN/L
0.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

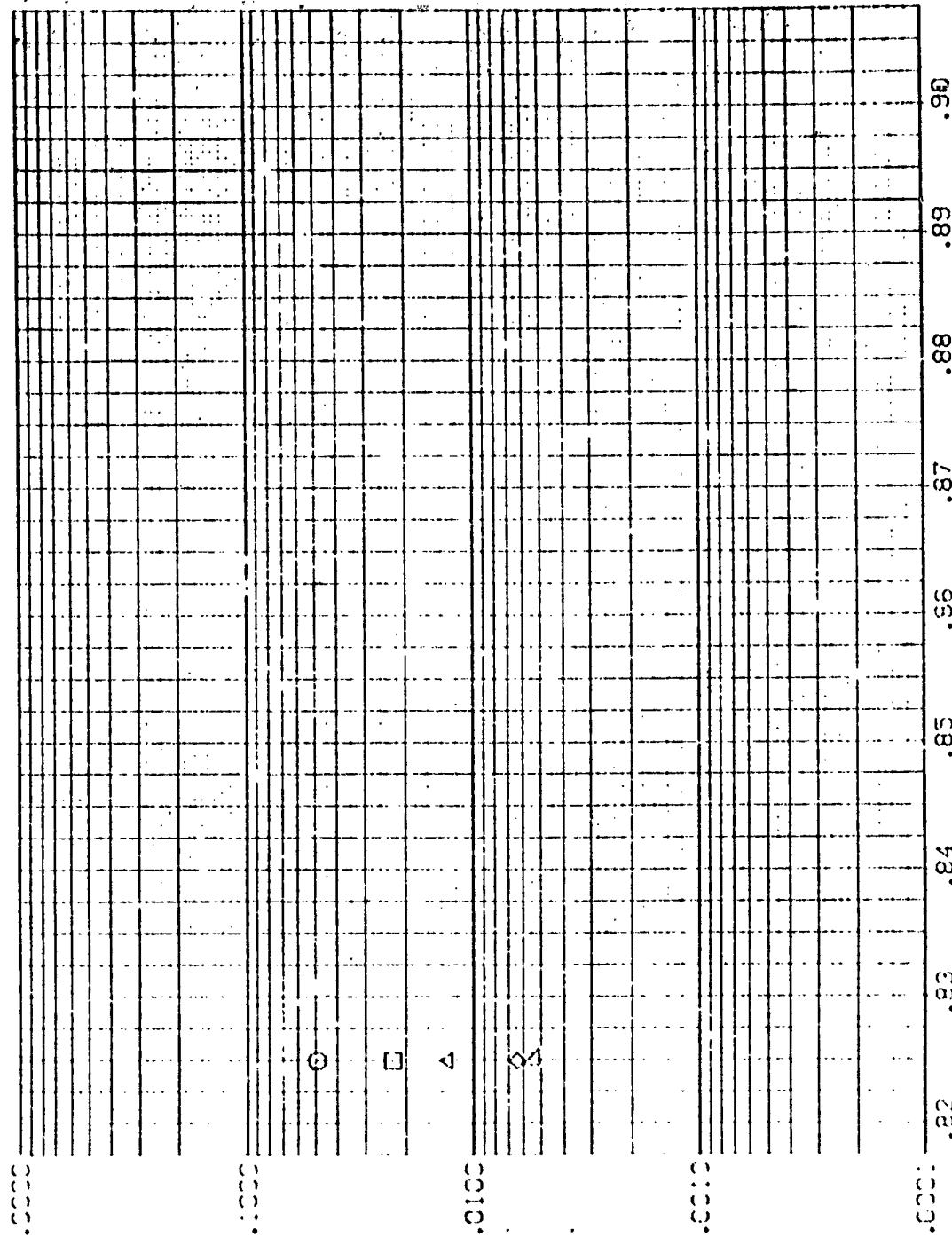


FIG. 14. 0.15 MGS PODS, ORBITER IN PRESENCE OF THE TANK

A blank sheet of graph paper with a grid pattern. The vertical axis is labeled from 0 to 1000 in increments of 100. The horizontal axis is labeled from 0 to 1000 in increments of 100. A small circle is drawn at the intersection of the 100 mark on the vertical axis and the 100 mark on the horizontal axis.

FIG. 14. ON'S PODS, OPERITER IN PRESENCE OF THE TANK

$$526.360 = 526.360$$

[illegible]

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

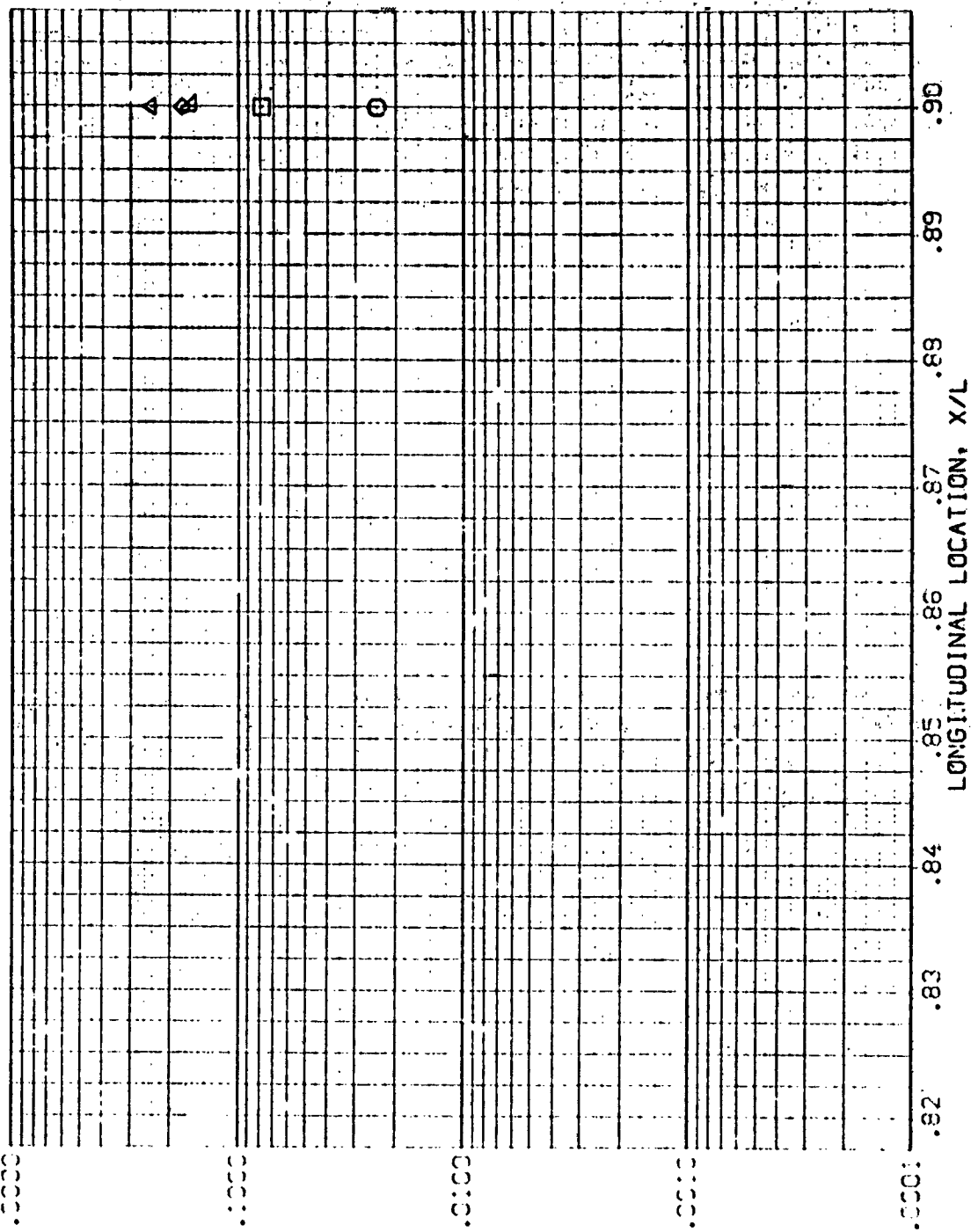


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

$W_{\text{eff}} = 3.300$        $W_{\text{eff}}/H = .900$        $Z = 420.000$

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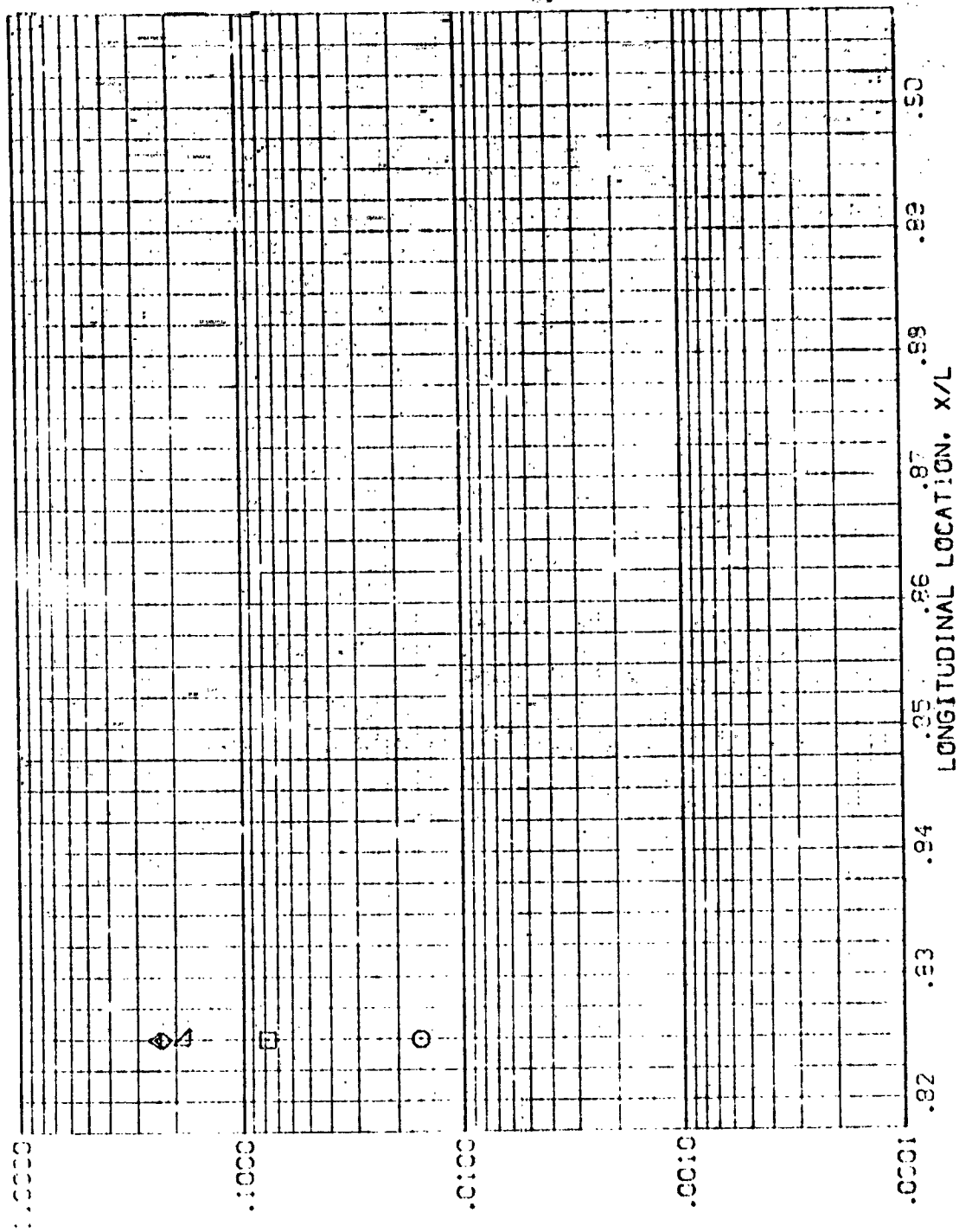
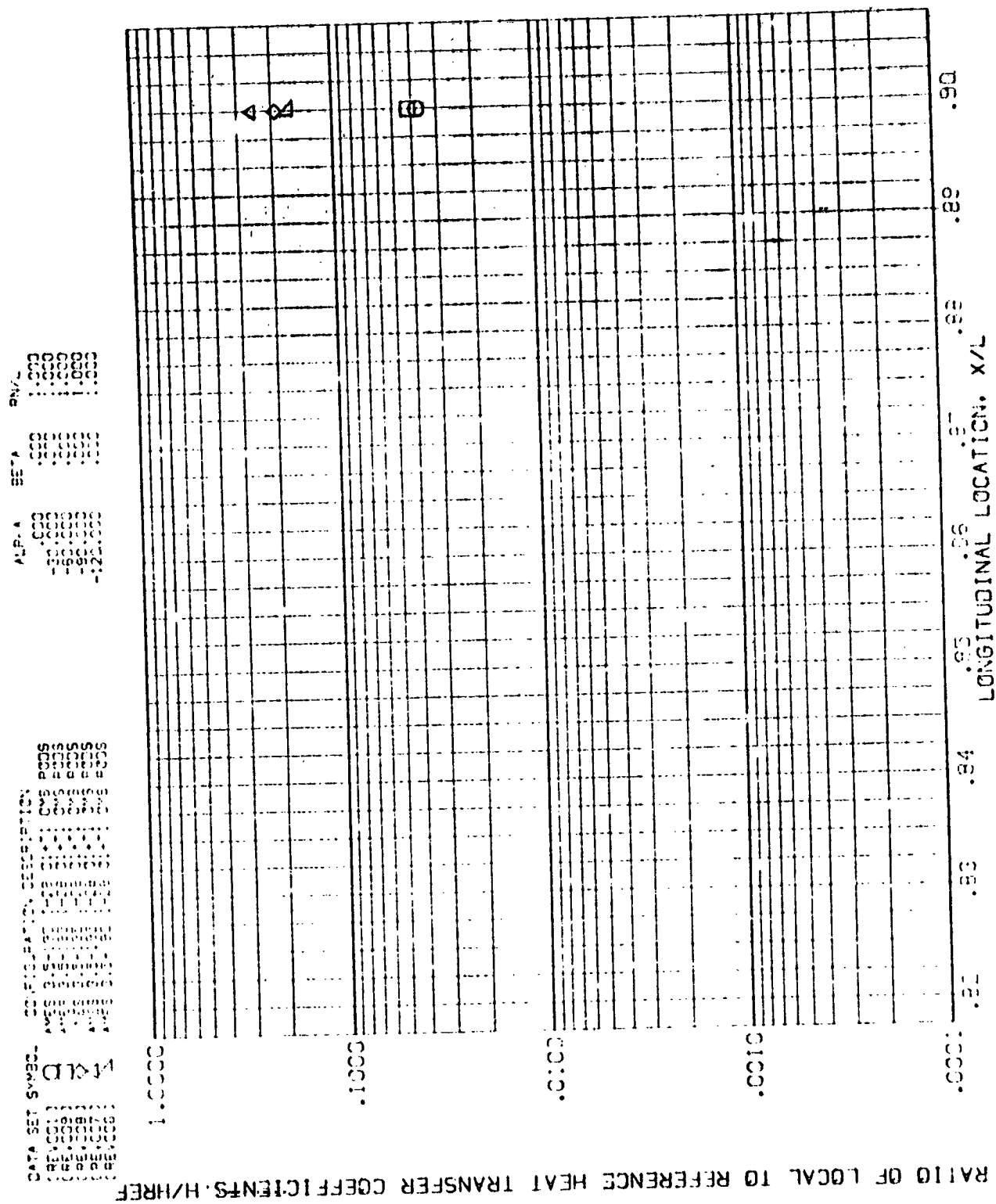
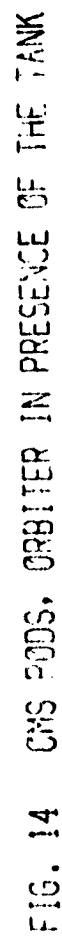


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

$$2400 = 3,300 - 4,300 = -1,000$$



[illegible][illegible]

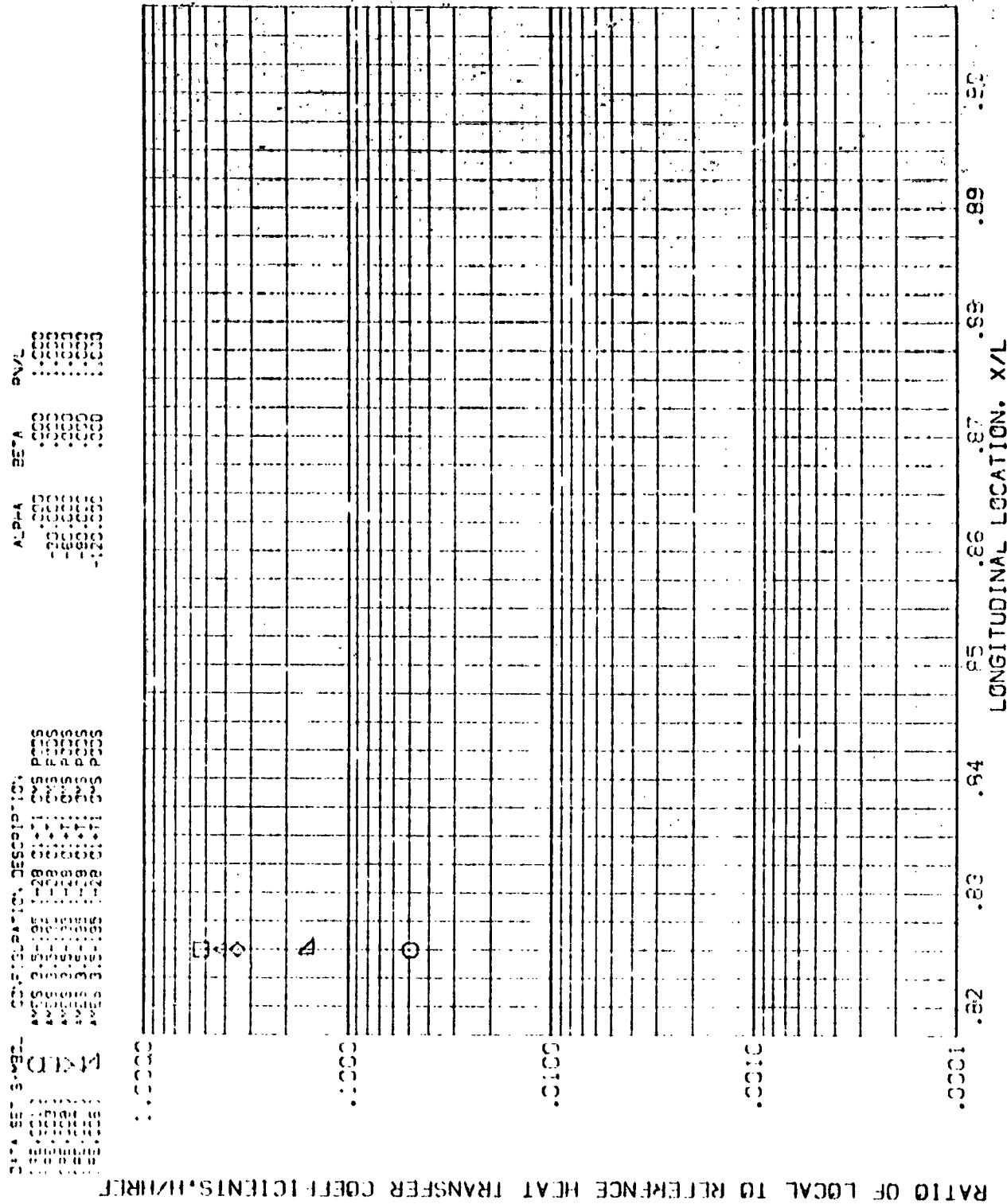


FIG. 14 GMS PODS. ORBITER IN PRESENCE OF THE TANK

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RATIO OF TOTAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$

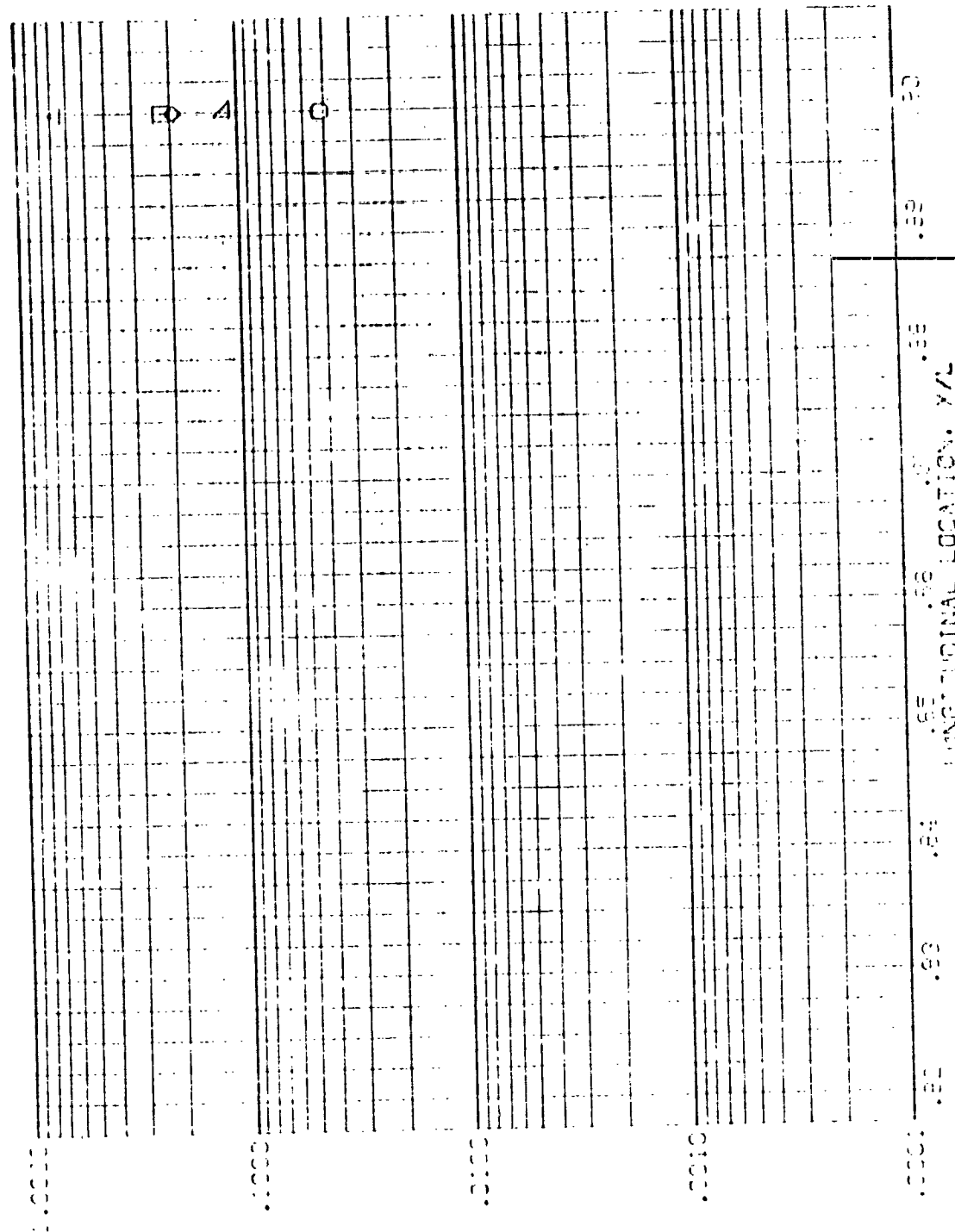


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

$$5.00 \times 10^{-4} = 518.000$$

APPROVED  
JANUARY 2003

DATA SET SYMCL CONFIGURATION DESCRIPTION  
 (E) (002) (E) (002) (E) (002) (E) (002) (E) (002)  
 AXS 3 5 1 05 1 28 01 11 0MS PODS  
 AXS 3 5 1 05 1 28 01 11 0MS PODS  
 AXS 3 5 1 05 1 28 01 11 0MS PODS  
 AXS 3 5 1 05 1 28 01 11 0MS PODS

ALPHA BETA RN/L  
 20.000 .000 1.000  
 30.000 .000 4.000  
 60.000 .000 1.000  
 60.000 .000 4.000

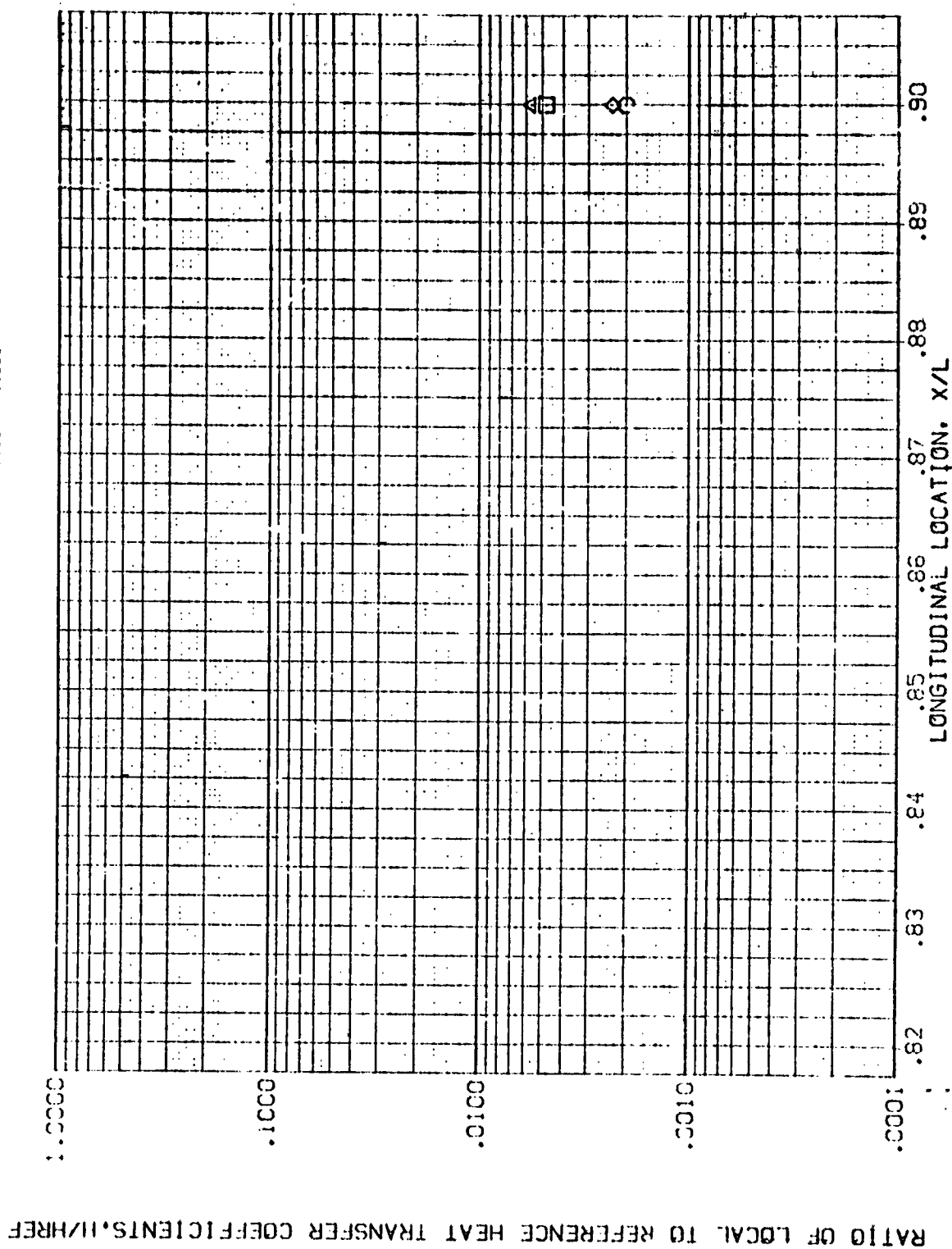


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 420.000

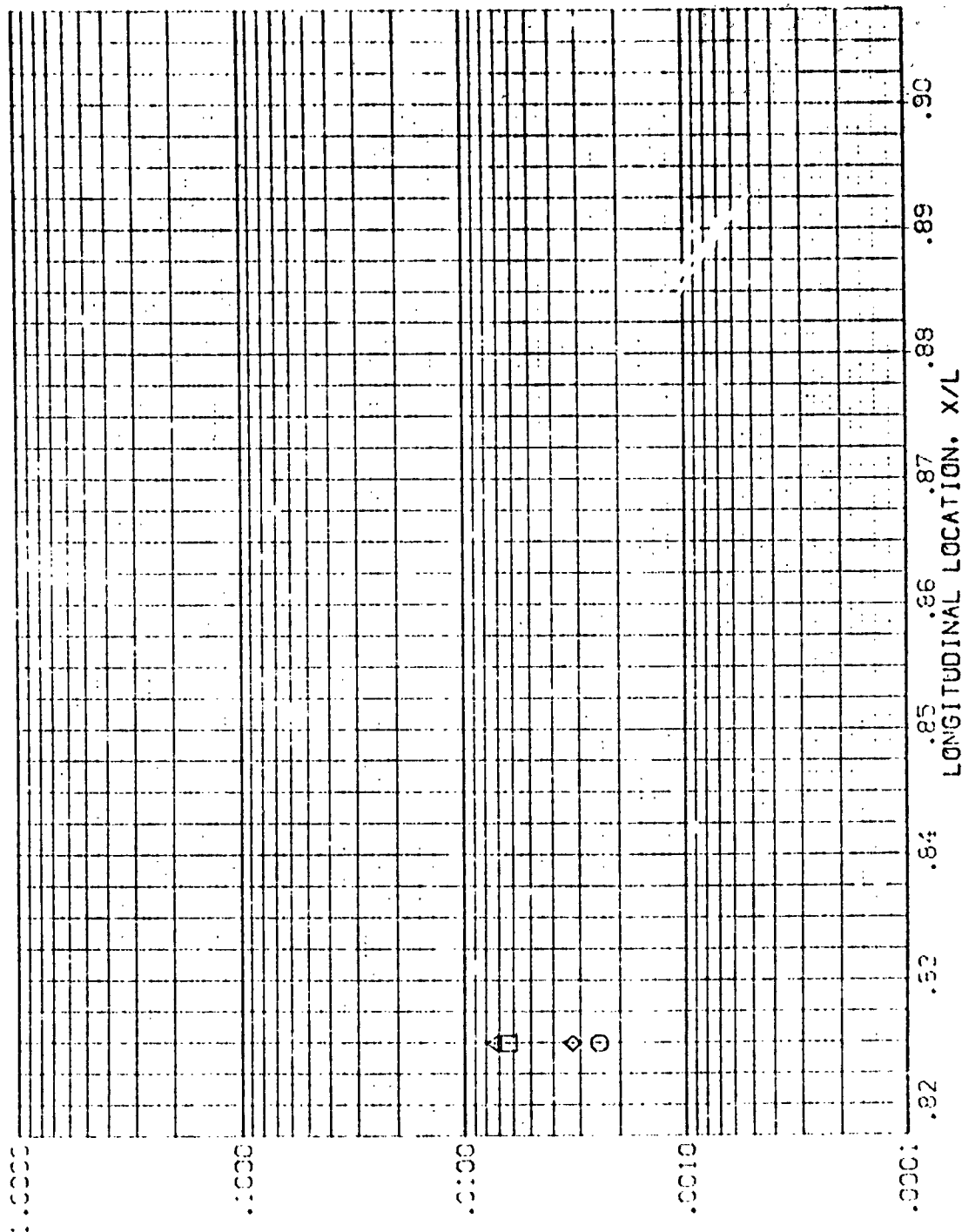
RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{ref}$ 

FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

$$Z = 475.000$$

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
000000	AVES 3.5-195 H28 C1-T1 CWS P00S	30.000	.000	1.000
000000	AVES 3.5-195 H28 C1-T1 CWS P00S	30.000	.000	4.000
000000	AVES 3.5-195 H28 C1-T1 CWS P00S	30.000	.000	1.000
000000	AVES 3.5-195 H28 C1-T1 CWS P00S	60.000	.000	4.000

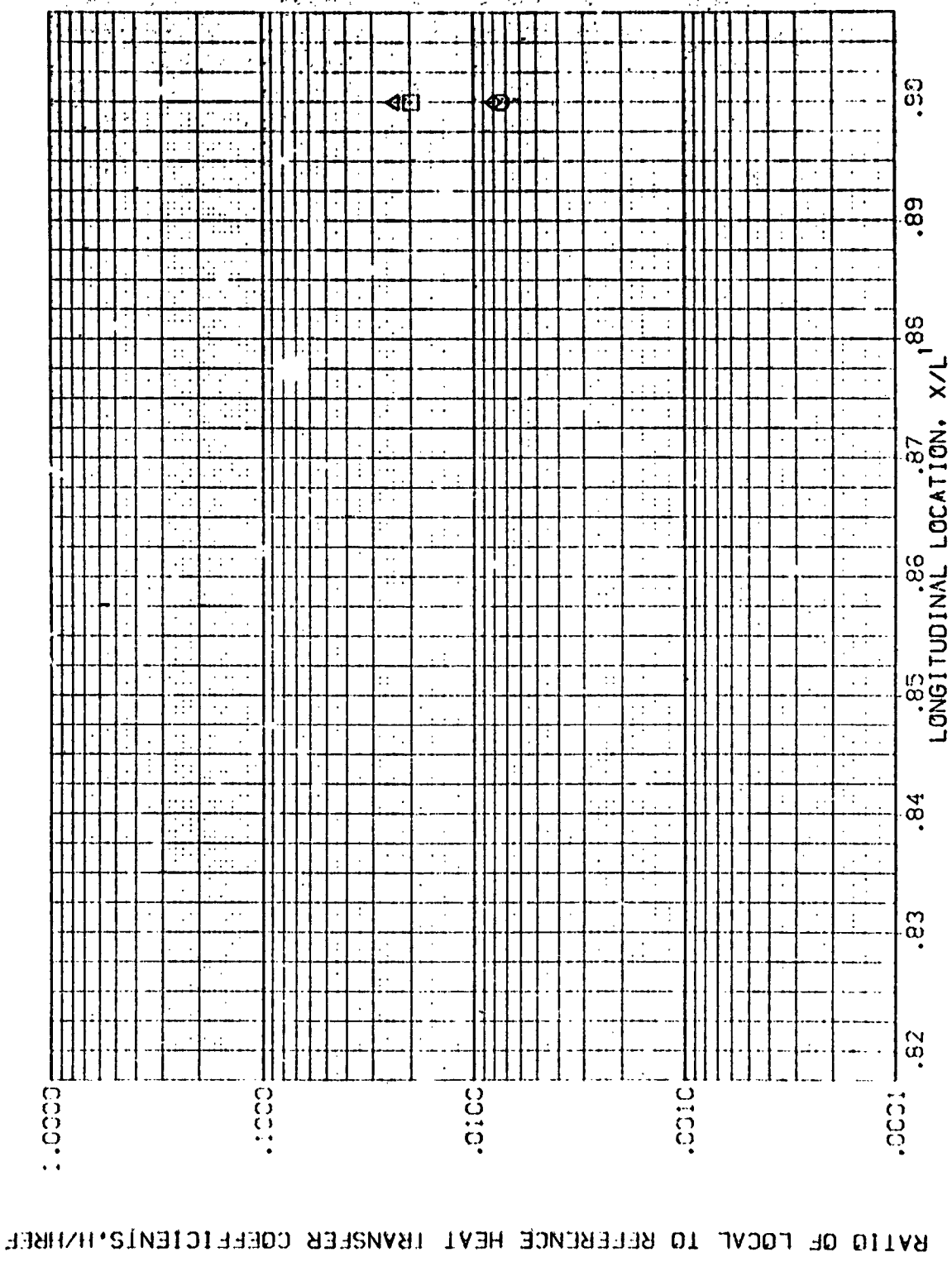


FIG. 14 QMS P00S, ORBITER IN PRESENCE OF THE TANK

WACH = 5.300 HAW/HT = .900 Z = 476.660

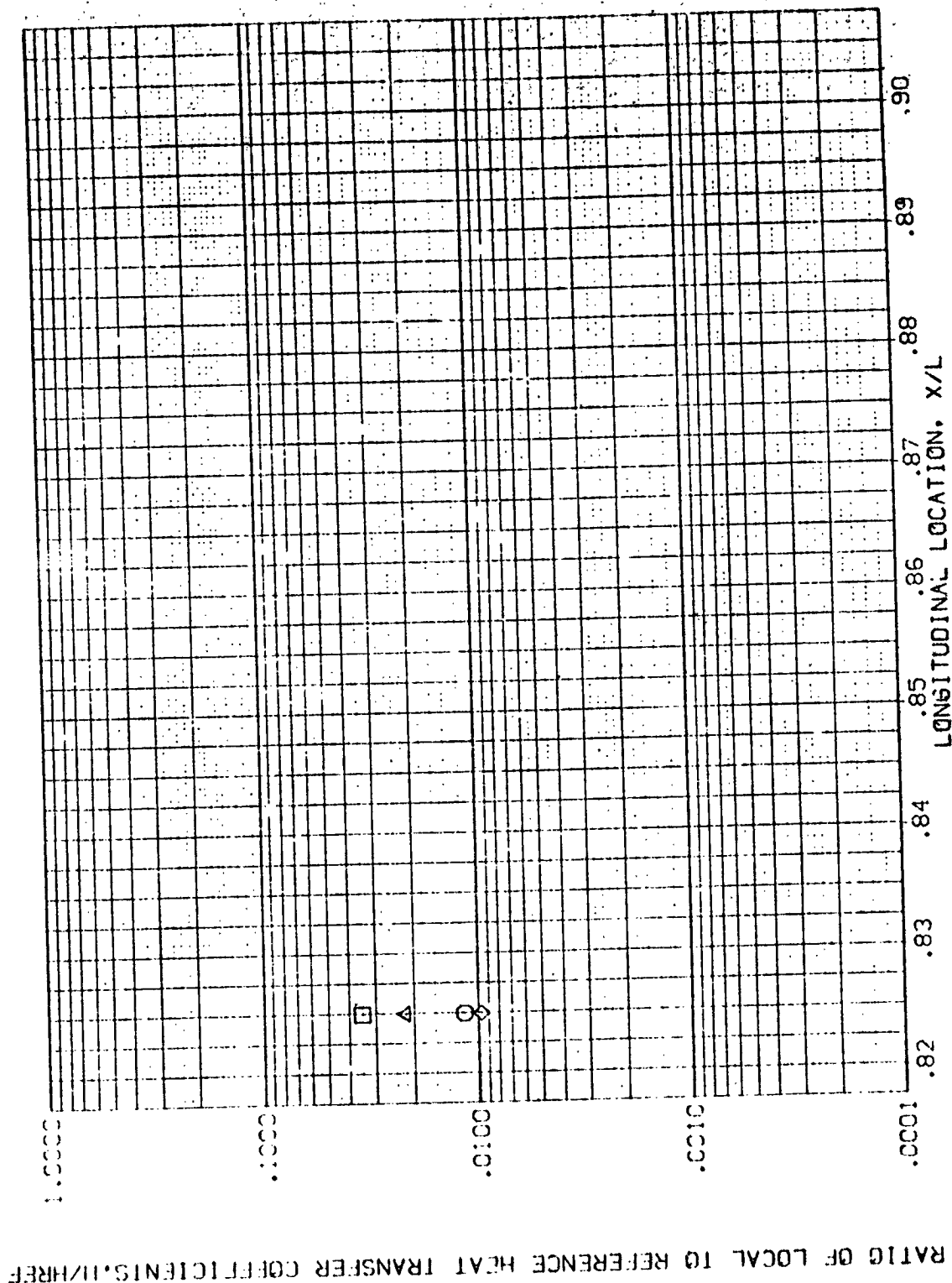
[illegible]

FIG. 14. ORBITS IN PRESENCE OF THE TANK

$$5.300 \text{ Hz} = 498.300 \text{ Z}$$

ALPHA	BETA	RN/L
30.000	.000	1.000
30.000	.000	4.000
60.000	.000	1.000
60.000	.000	4.000

DATA SET SYMBOL	CONFIGURATION DESCRIPTION
001	AVS 3.5-1.85 1428 01+1 CMS PODS
002	AVS 3.5-1.85 1428 01+1 CMS PODS
003	AVS 3.5-1.85 1428 01+1 CMS PODS
004	AVS 3.5-1.85 1428 01+1 CMS PODS

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

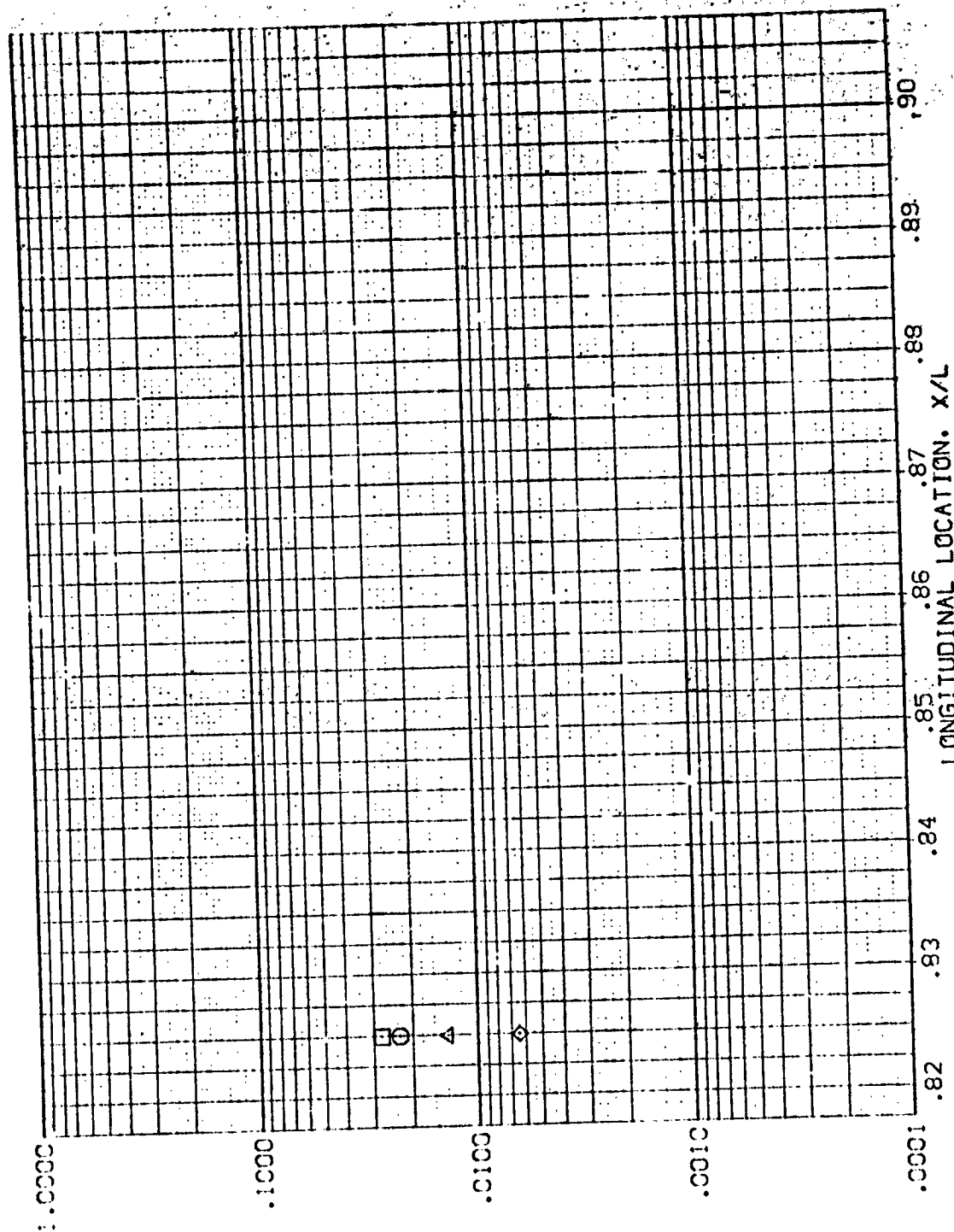


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAX/HT = .900 Z = 510.000

ALPHA	BETA	FUEL
30.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
60.000	.000	4.000

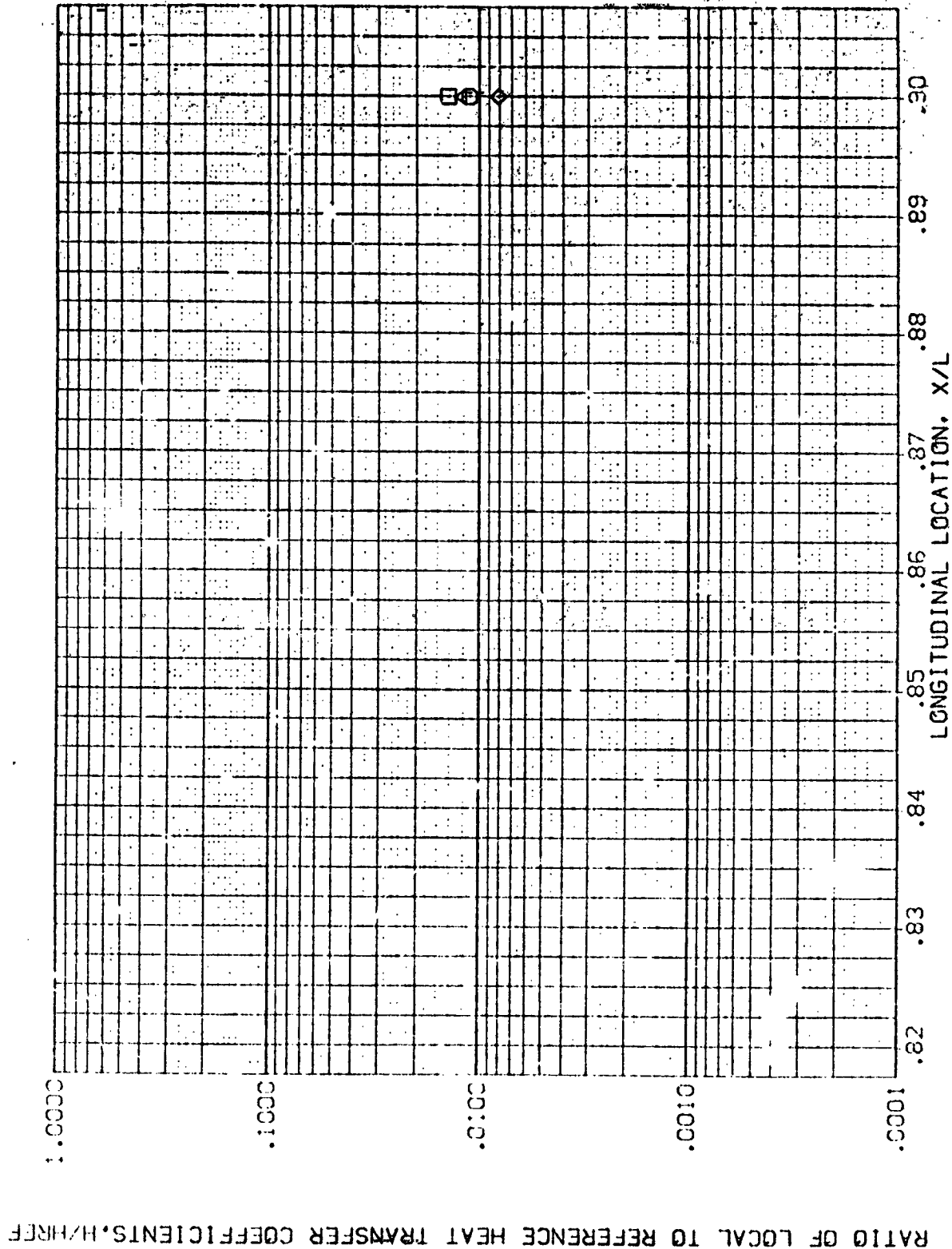


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

MAC- = 5.300 H4W/HT= .900 Z = 526.660

DATA SET SYMBOL: 0  
 CONFIGURATION DESCRIPTION: AYES 3.5-195 1-28 01-71 QMS P00S  
 AYES 3.5-195 1-28 01-71 QMS P00S

ALPHA: 30.000  
 BETA: .000  
 RM/L: 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

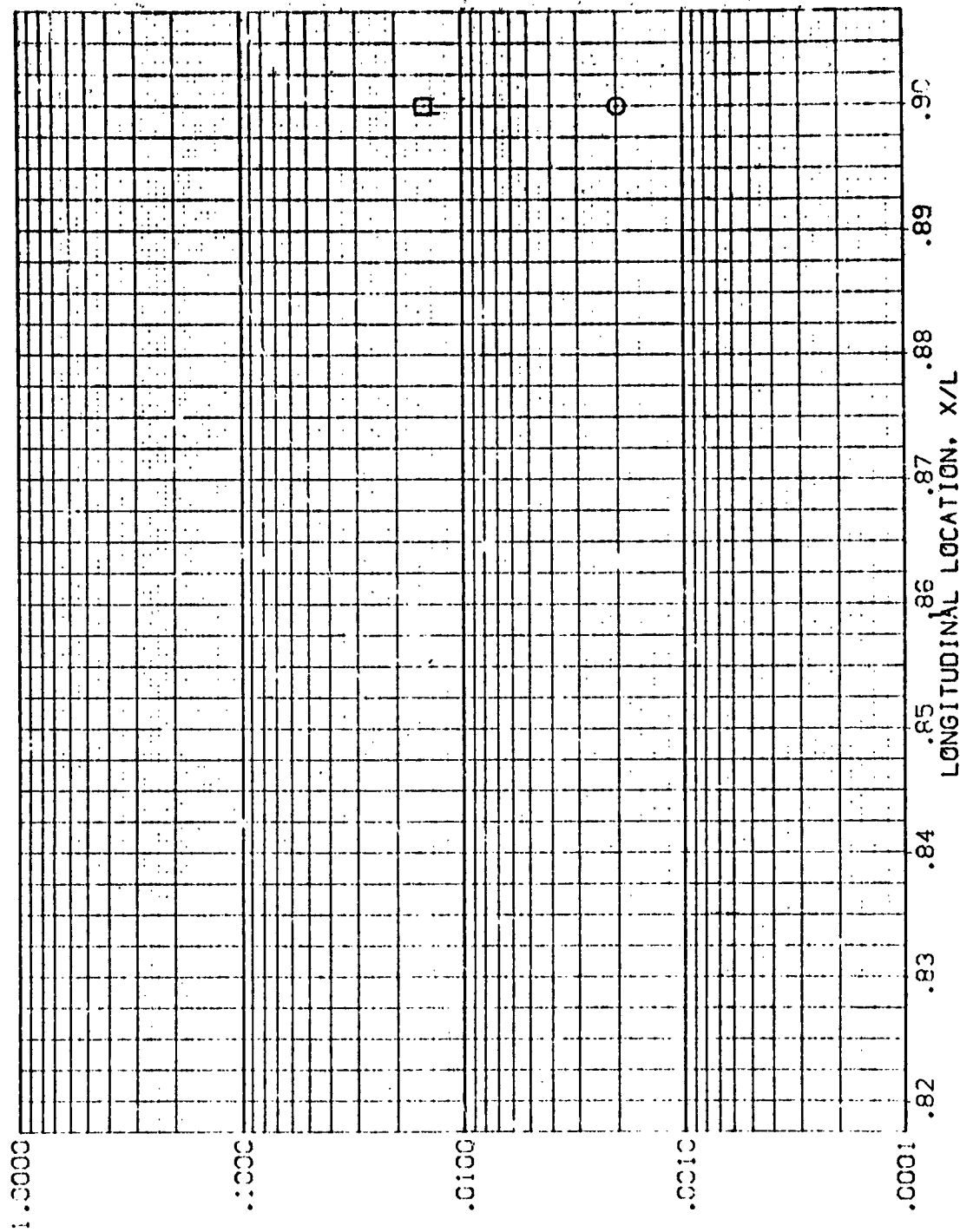


FIG. 14 QMS P00S, ORBITER IN PRESENCE OF THE TANK

YAC = 5.300 H/HREF = .900 Z = 420.000



DATA SET SWELL CONFIGURATION DESCRIPTION  
 (RECORD) AVEB 3-5-193 1428 01:11 OMS PODS  
 (RECORD) AVEB 3-5-193 1428 01:11 OMS PODS

ALPHA BETA  
 30.000 1.000  
 30.000 1.000  
 30.000 -5.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS, H/HREF

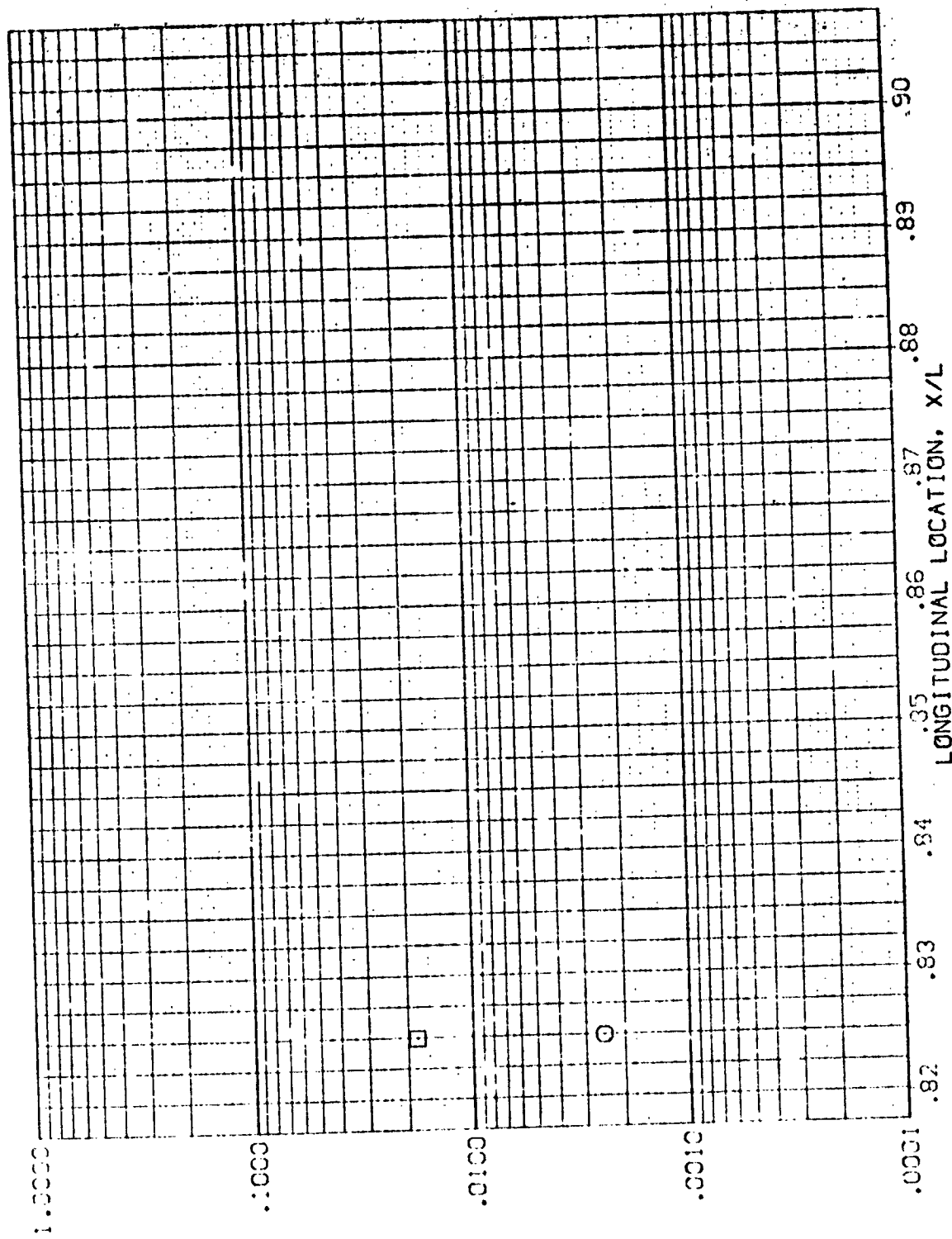


FIG. 14 OMS PODS, ORBITER IN PRESENCE OF THE TANK

MACH = 5.300 HAW/HT = .900 Z = 475.000

DATA SET 5-1321  
 CONFIGURATION DESCRIPTION  
 AYES 3.5-135 1-28 01+11 0MS 700S  
 AYES 3.5-135 1-28 01+11 0MS 700S  
 ALPHA BETA RN/L  
 30.000 .200 1.000  
 30.000 -5.000 1.000

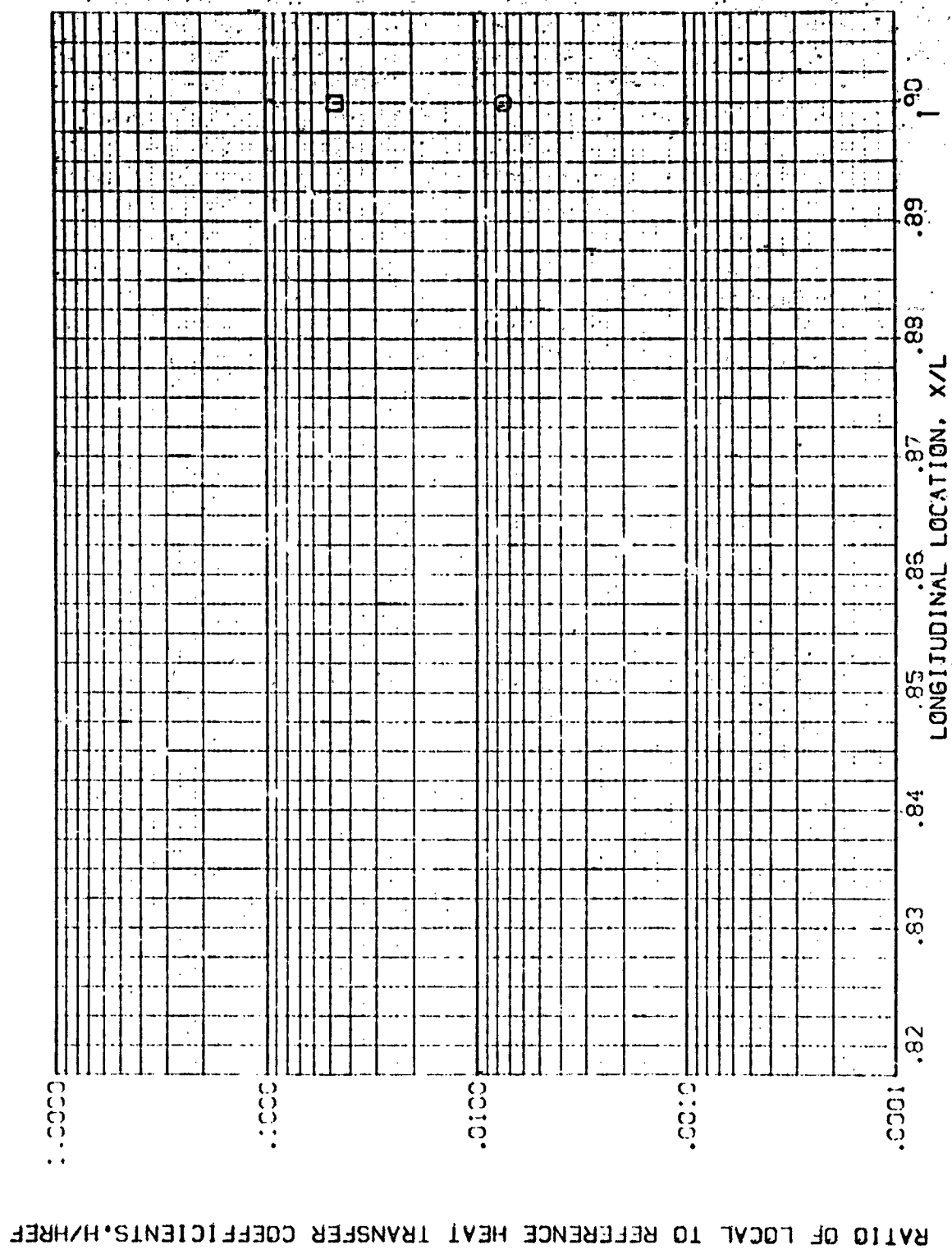


FIG. 14 0MS PODS, ORBITER IN PRESENCE OF THE TANK

WAC = 5.300 -AW/WT= .900 Z = 477.060

DATA SET NAME: CONFIGURATION DESCRIPTION  
 CASE 1001: 1-28 01:11 CMS PODS  
 CASE 1002: 1-28 01:11 CMS PODS

ALPHA BETA GAMMA  
 20.000 0.000 1.000  
 20.000 -5.000 1.000

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h/h_{REF}$

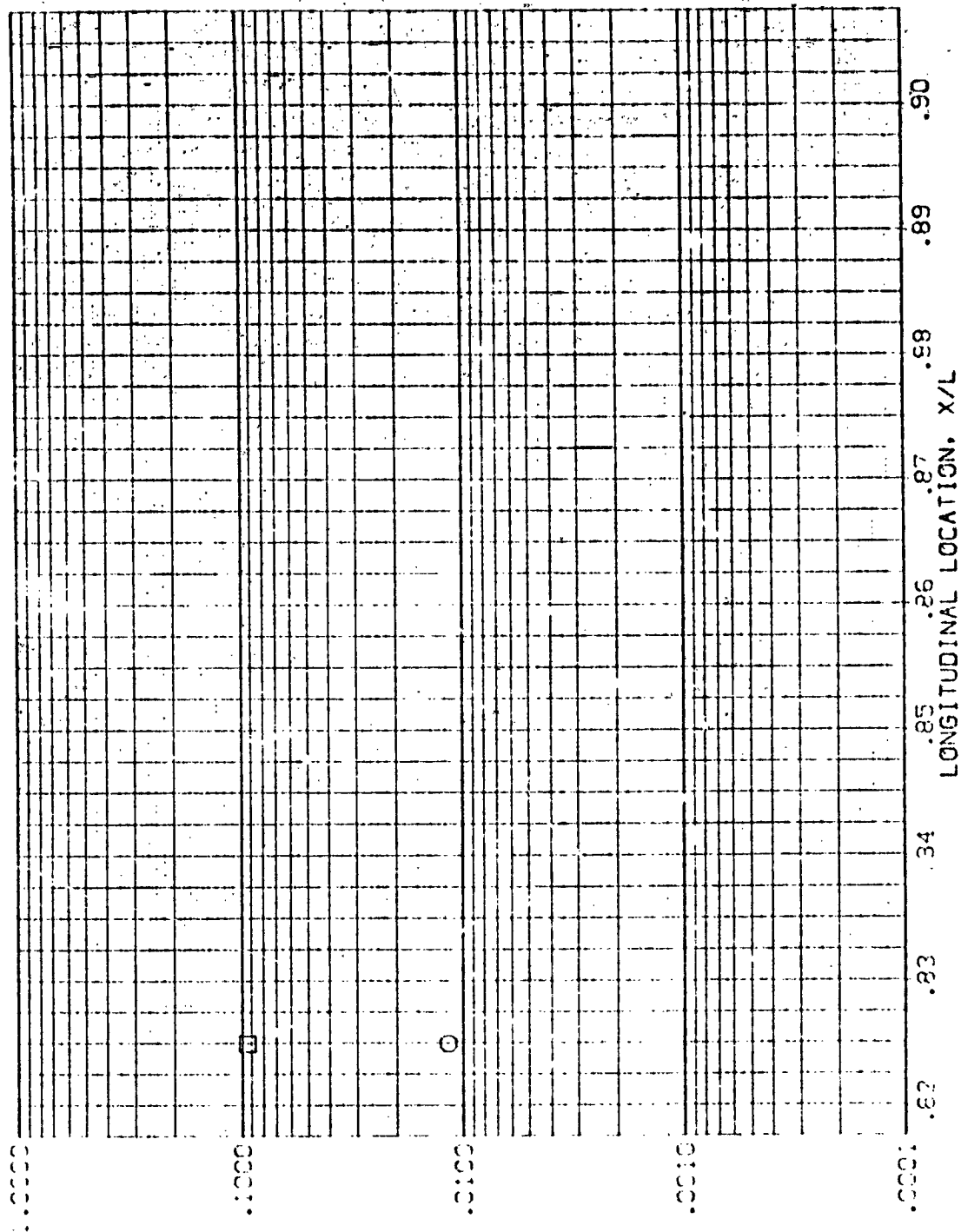


FIG. 14 CMS PODS, ORBITER IN PRESENCE OF THE TANK

$h_{REF} = 5.000$   $h_{REF}/h_{REF} = 1.000$   $Z = 488.000$

ALPHA	BETA	DELTA
30.000	000.000	1.000
30.000	-5.000	1.000

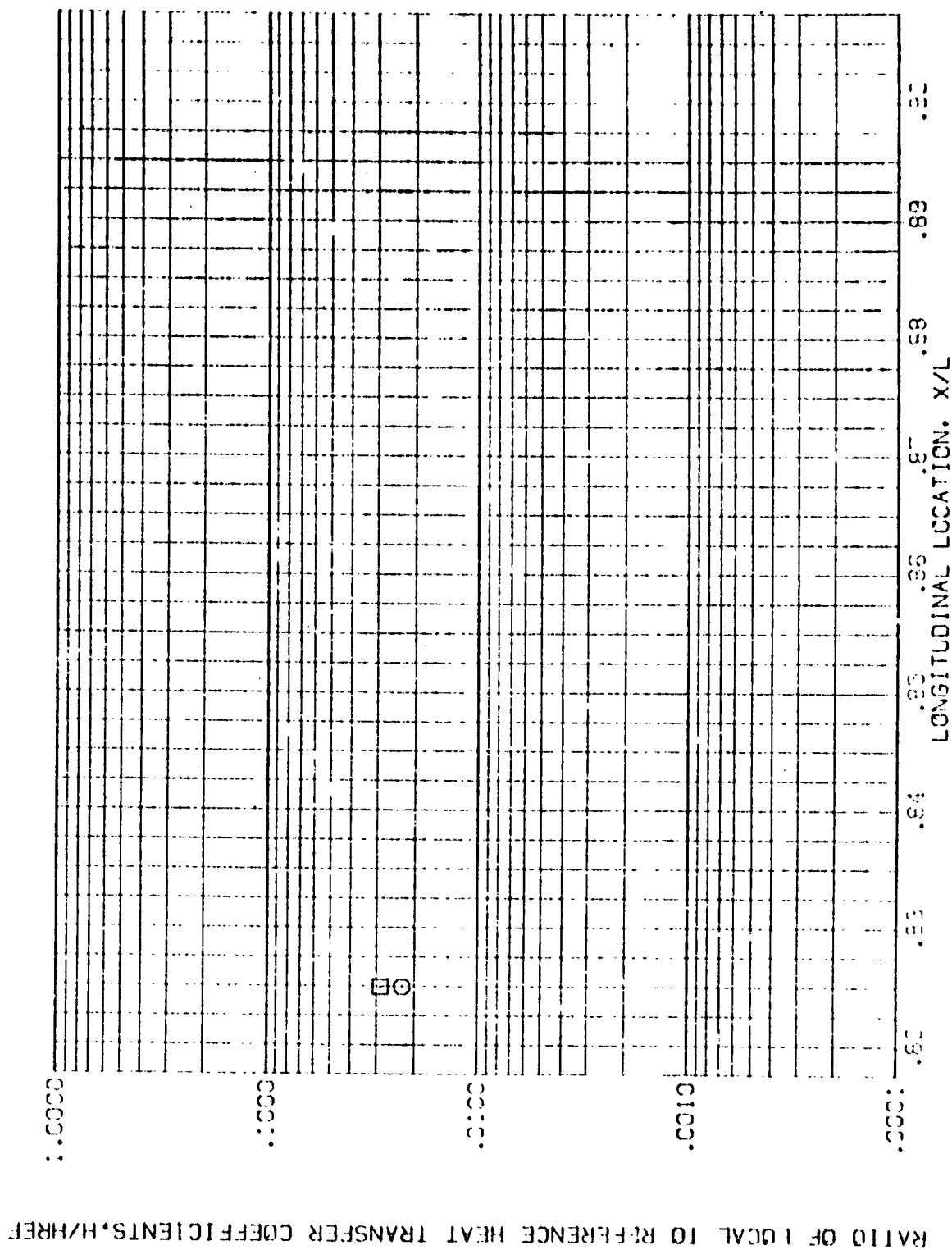


FIG. 14. 3MS PDCS. ORBITER IN PRESENCE OF THE TANK

RATIO OF LOCAL TO REFERENCE HEAT TRANSFER COEFFICIENTS,  $h_x/h_{ref}$

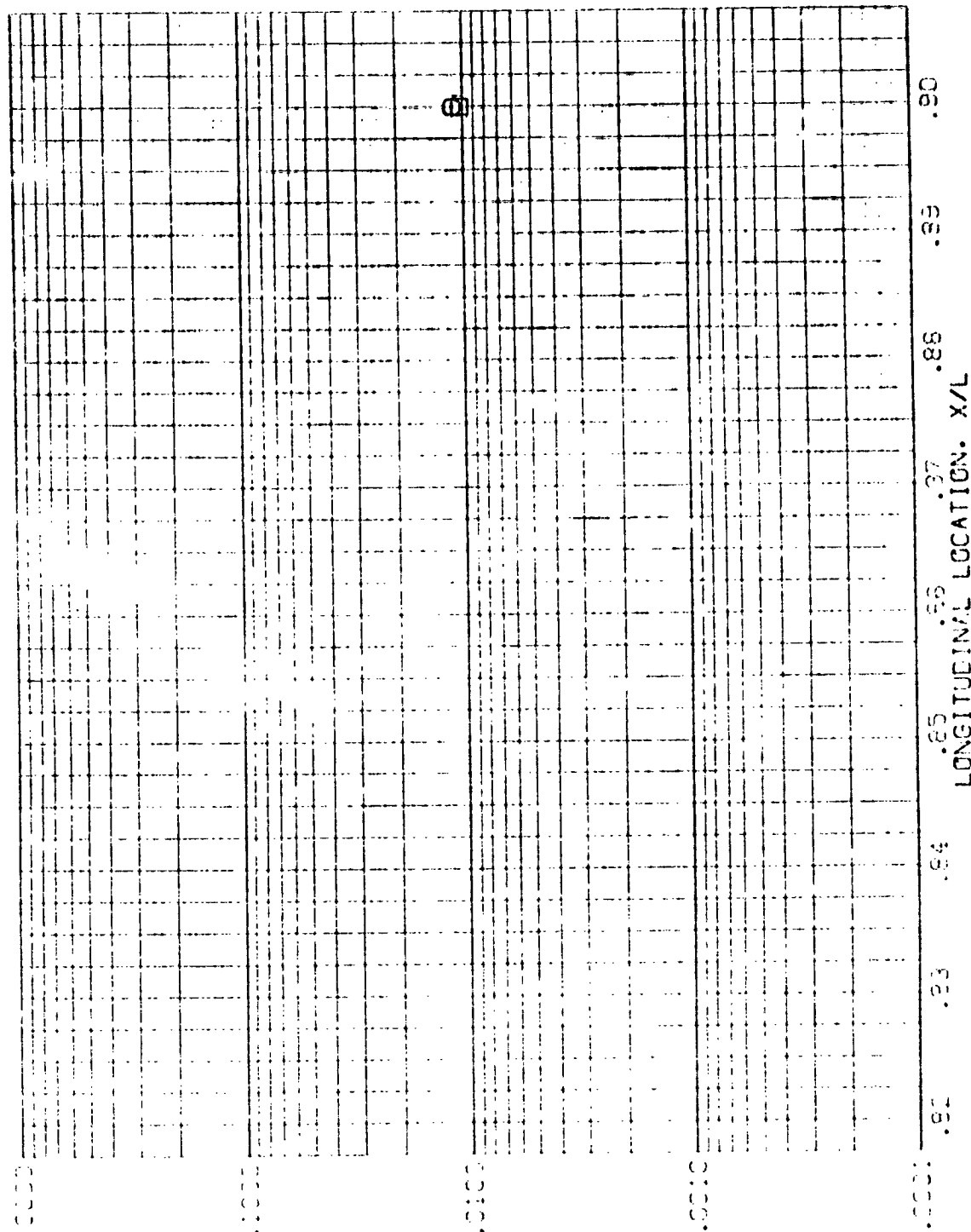


FIG. 14 0.5% PODS. ORBITER IN PRESENCE OF THE TANK

(BEVC01)

PARAMETRIC VALUES

ALPHA .000 BETA .000

RN/L 1.000

AMES 3.5-195 IH28 01+T1 QMS PODS

SYMBOL Z HAW/HAT MACH

420.000 .900 5.228

475.000

476.660

488.300

510.000

526.660

100.00

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

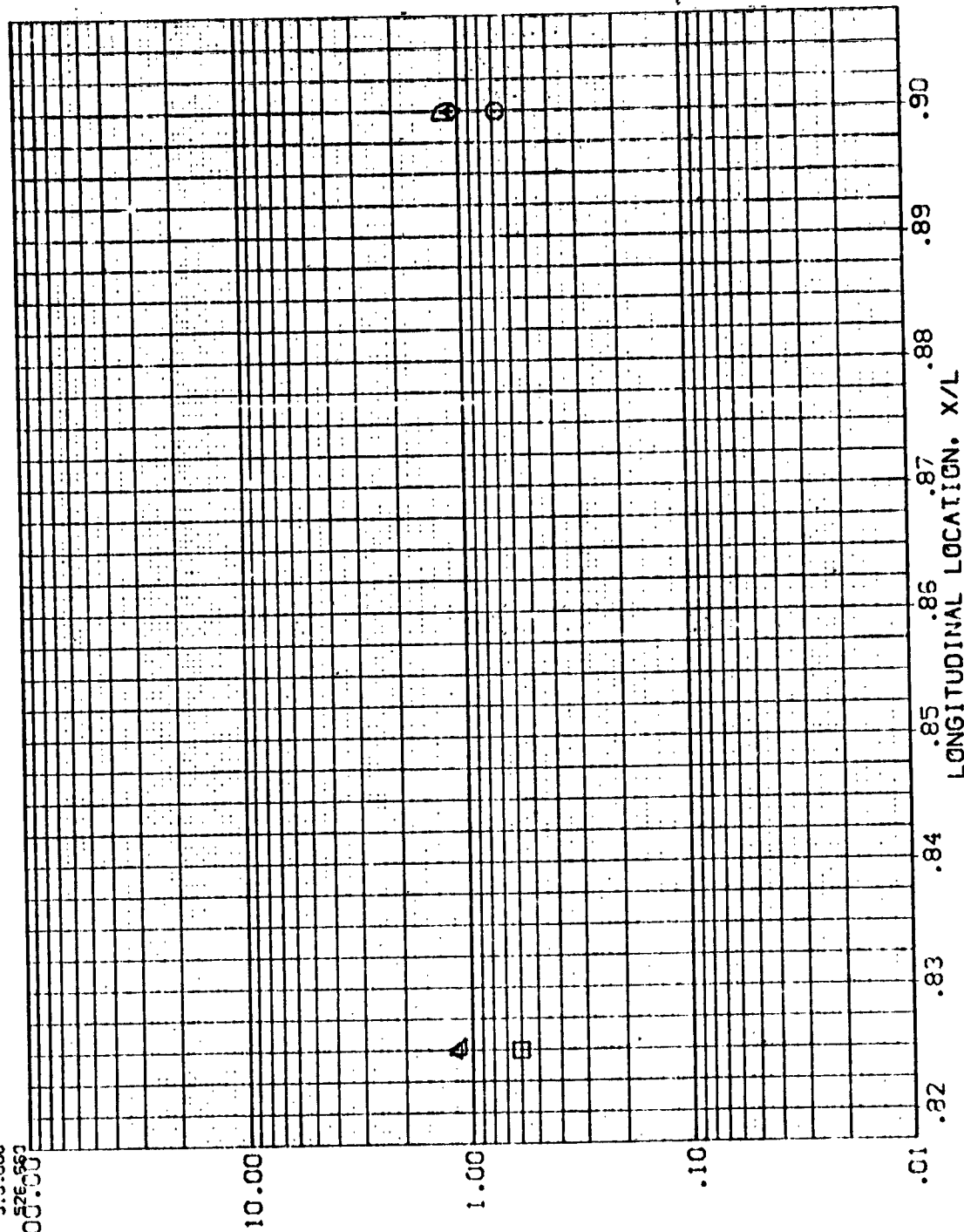


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 QMS PODS

(BEVC03)

PARAMETRIC VALUES  
ALPHA 60.080 BETA .000  
RN/L 1.000

SYMBOL Z HAW/PT MACH  
423.000  
475.000  
476.660  
488.300  
510.000  
528.660  
541.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

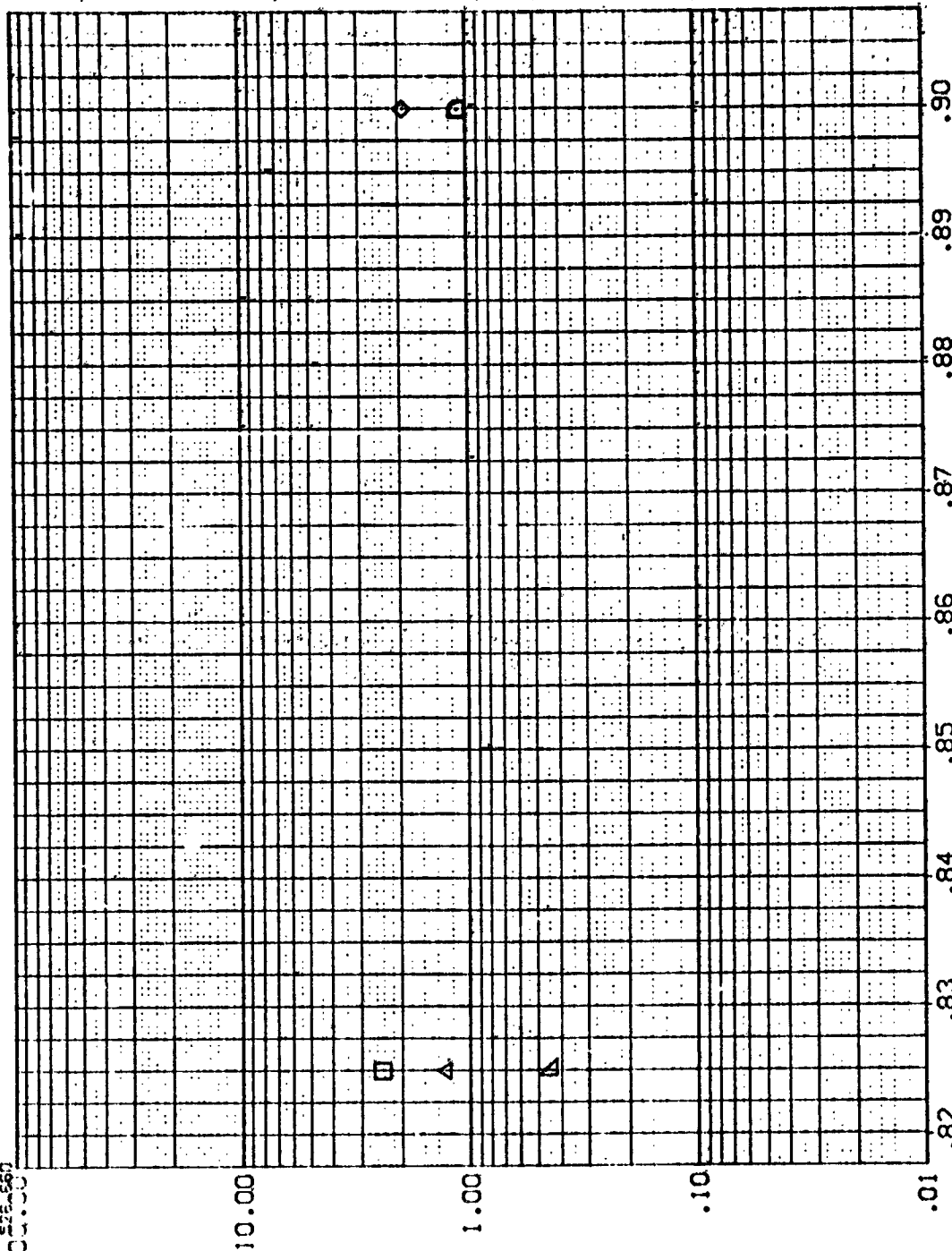


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED



AMES 3.5-195 IH28 01+T1 QMS PODS

(BE(CO4)

PARAMETRIC VALUES  
 ALPHA 90.000 BETA .000  
 RN/L 1.000

MAN/HT .900 MACH 5.219

5050-  
 420.000  
 475.000  
 476.660  
 488.300  
 510.000  
 526.800  
 100.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

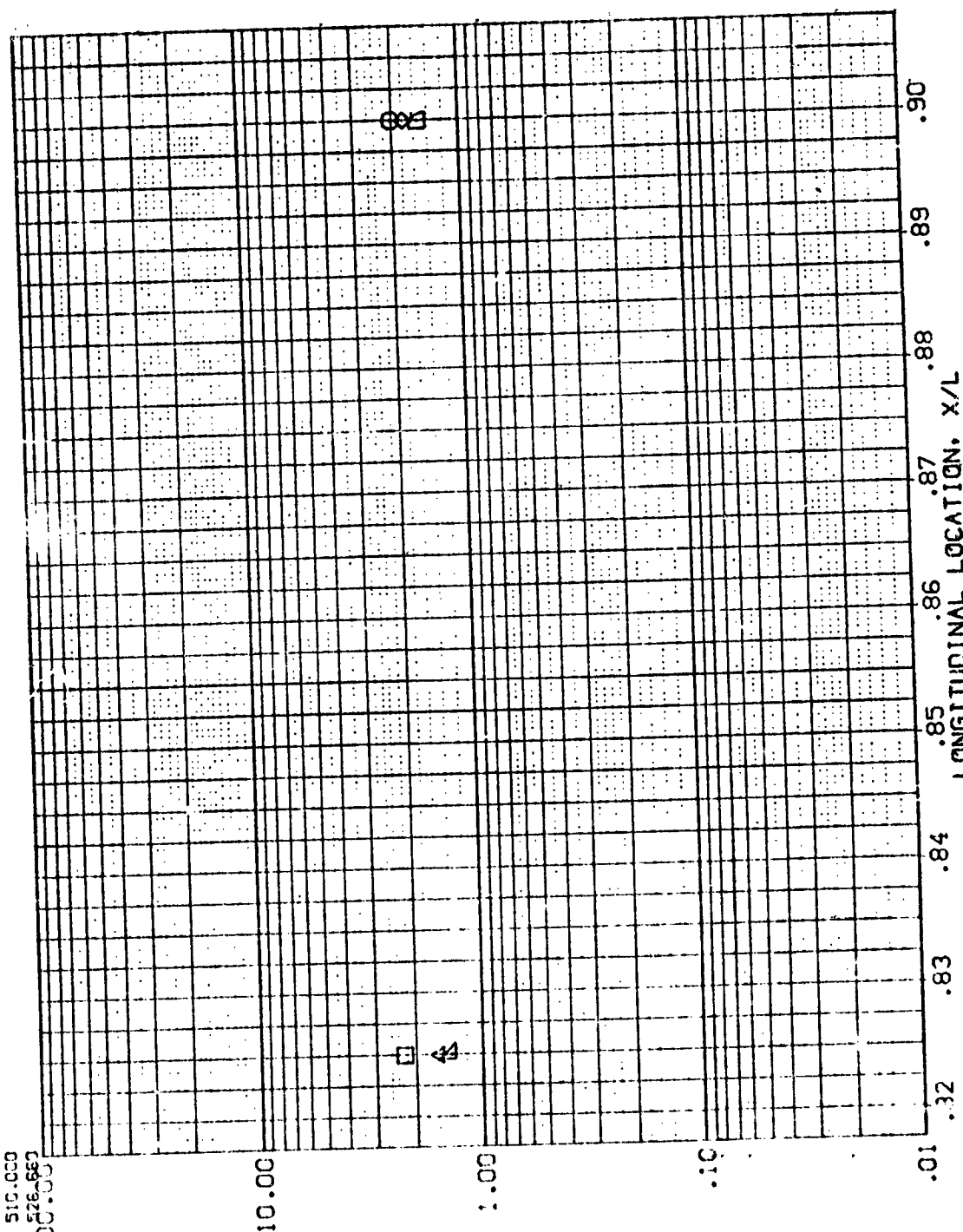


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

(BVC05)

**SYMBOL**

MSGL	Z
429.000	429.000
475.000	475.000
476.663	476.663
488.300	488.300
510.000	510.000
525.660	525.660

MASS	MASS
5.220	5.220

PARAMETRIC VALUES	
ALPHA	120.000
BETA	1.000
RN/L	.000

ELIMINATION OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS. H1/HU

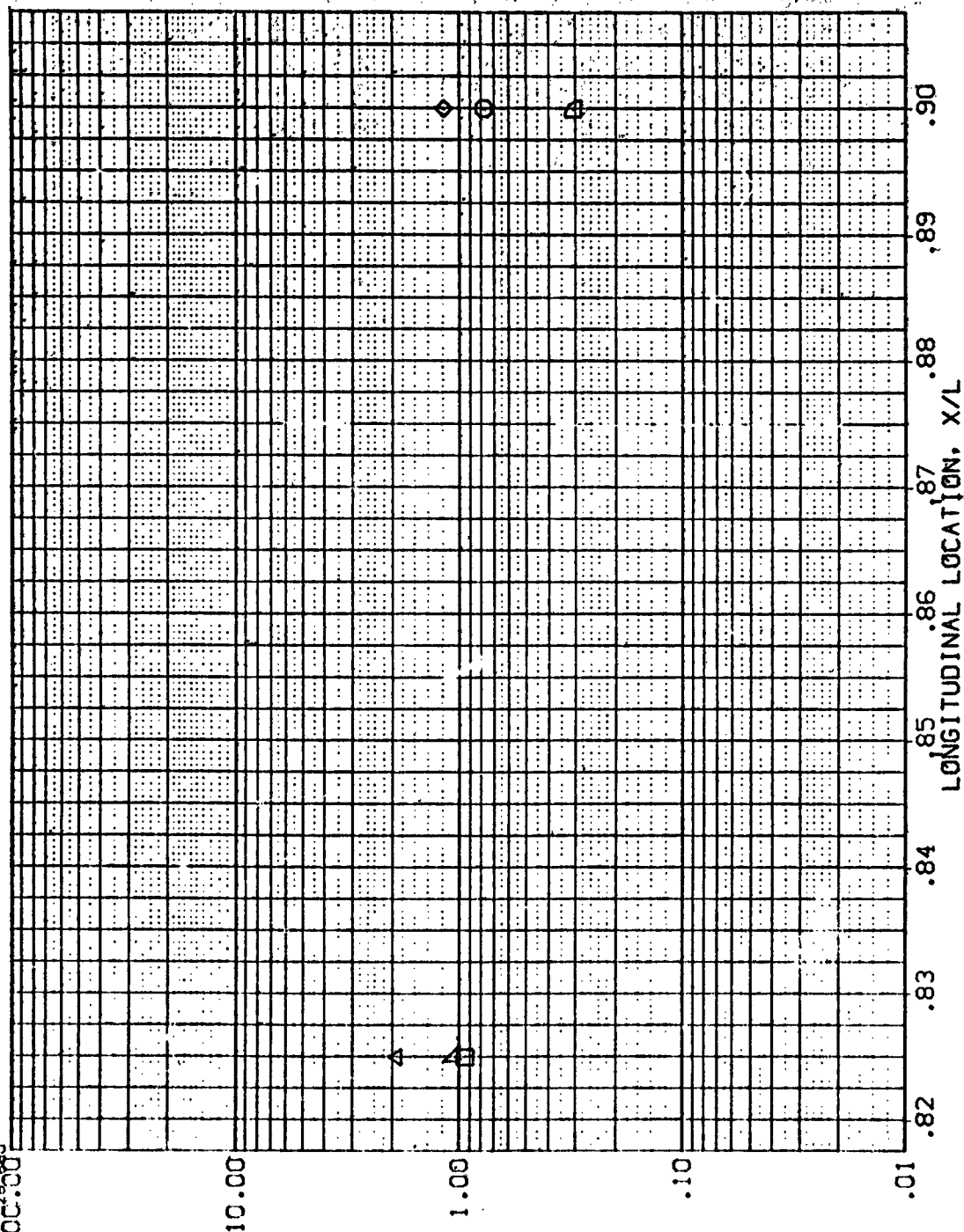


FIG. 15 RMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

ANES 3.5-105 IH20 C-T, QMS PODS

(25V008)

MAW/HT .900 MACH 5.220

PARAMETRIC VALUES  
ALPHA -120.000 BETA 1.000  
RN/L

SEVER  
420.000  
475.000  
476.660  
488.300  
510.000  
526.600  
530.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H/H_U$

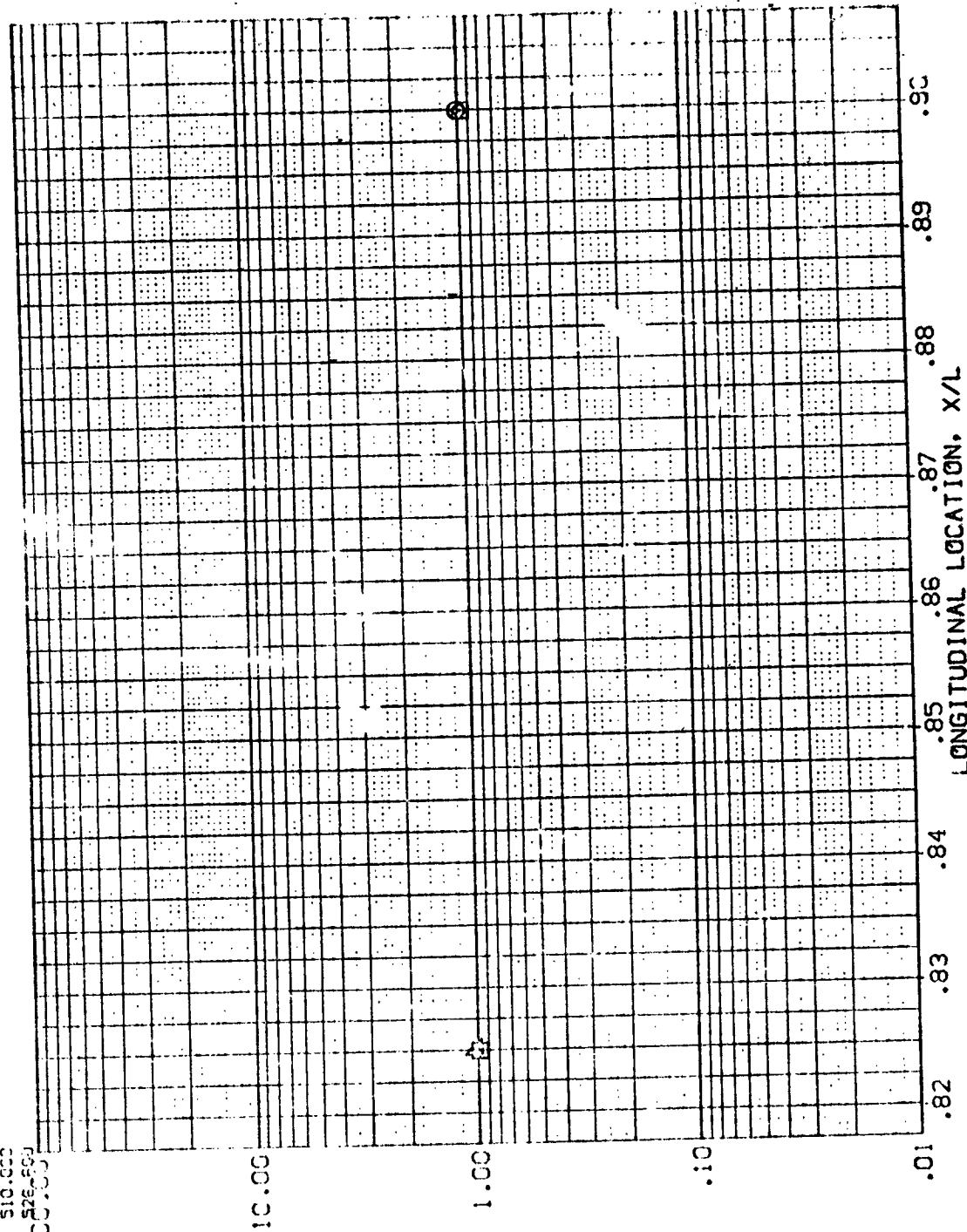


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

(BEVC07)

PARAMETRIC VALUES

ALPHA: .000

RN/L: .000

BETA: .000

AMES 3.5-195 IH28 01+T1 QMS PODS

SYMBOL Z HAW/HT MACH

420.000 .900 5.219

475.000

476.650

488.300

510.000

526.550

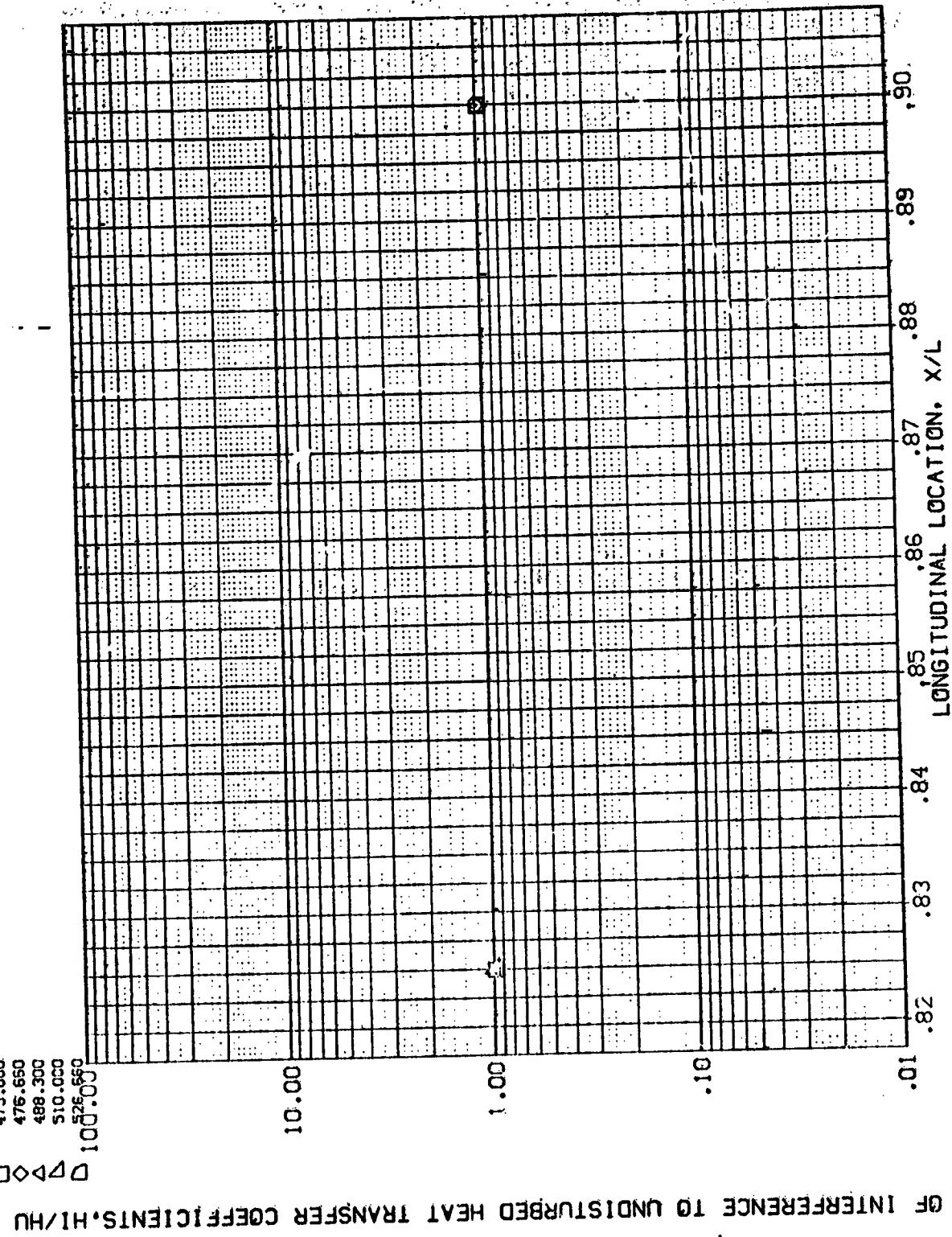


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 QMS PODS

(USE MCC8)

SYMBOL Z HAW/HT MACH

420.000  
475.000  
475.660  
488.300  
510.000  
525.660  
:00.000

PARAMETRIC VALUES  
ALPHA  
RNL  
BETA  
1.000  
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RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

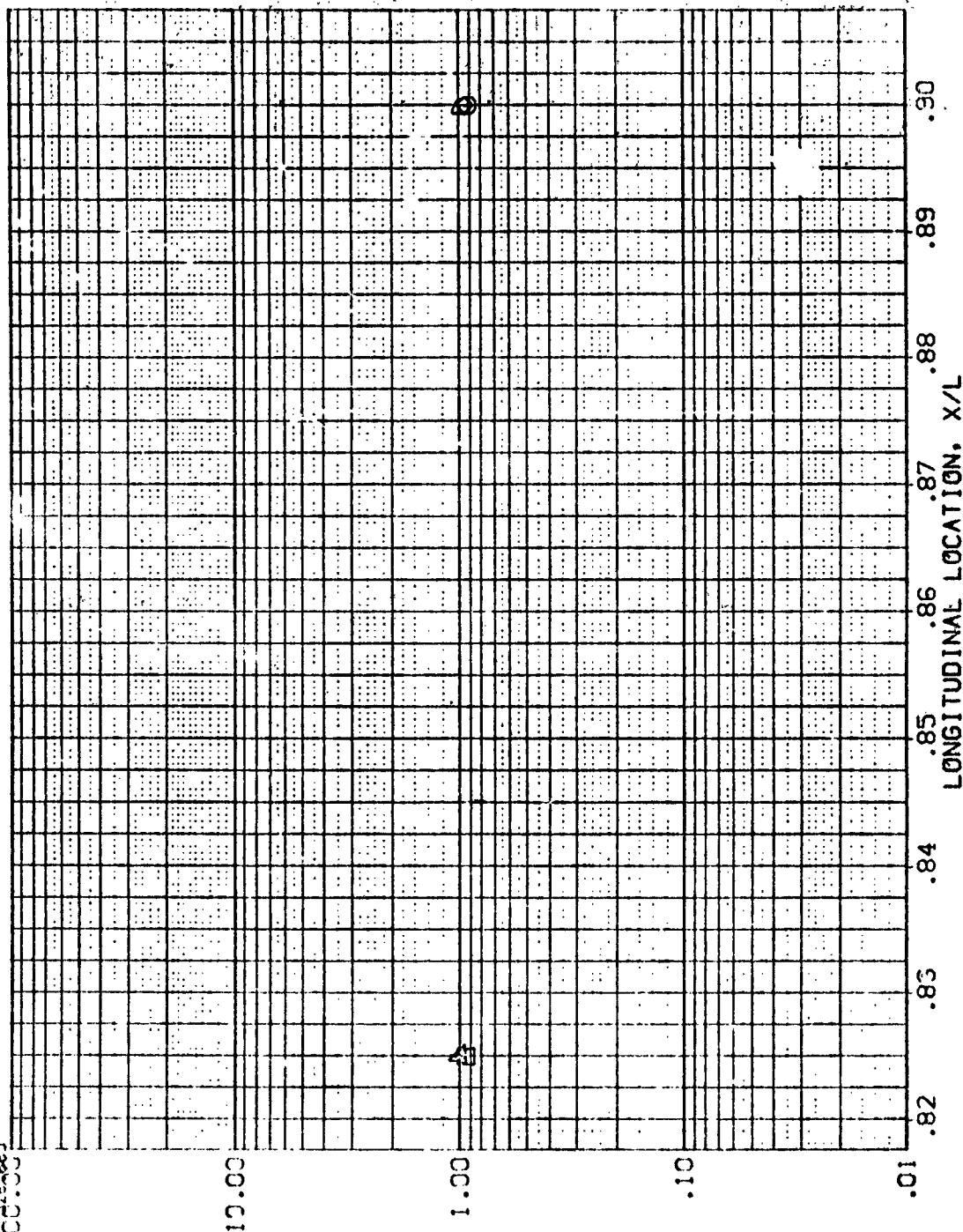


FIG. 15 QMS PODS. RATIO OF INTERFERENCE TO UNDISTURBED

AMES 3.5-195 IH28 01+T1 QMS PODS

(BEVCO9)

SYMBOL Z  
 420.000  
 475.000  
 476.660  
 488.300  
 510.000  
 526.660  
 100.000

HAW/WT MACH  
 .900 5.220

PARAMETRIC VALUES  
 ALPHA -30.000 BETA .000  
 RN/L 1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h_i/h_u$

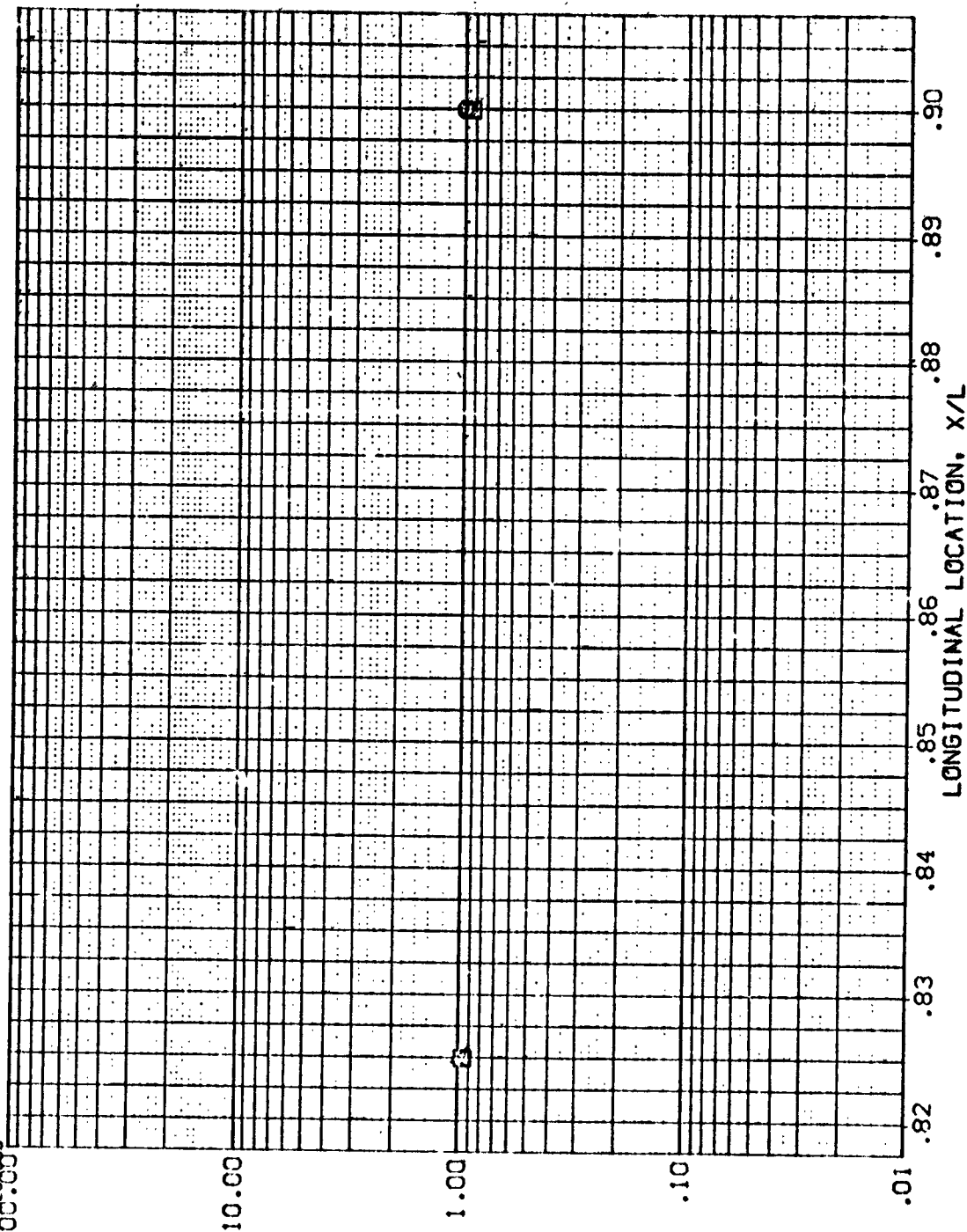


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

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ALPHA	BETA	P/V/L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000

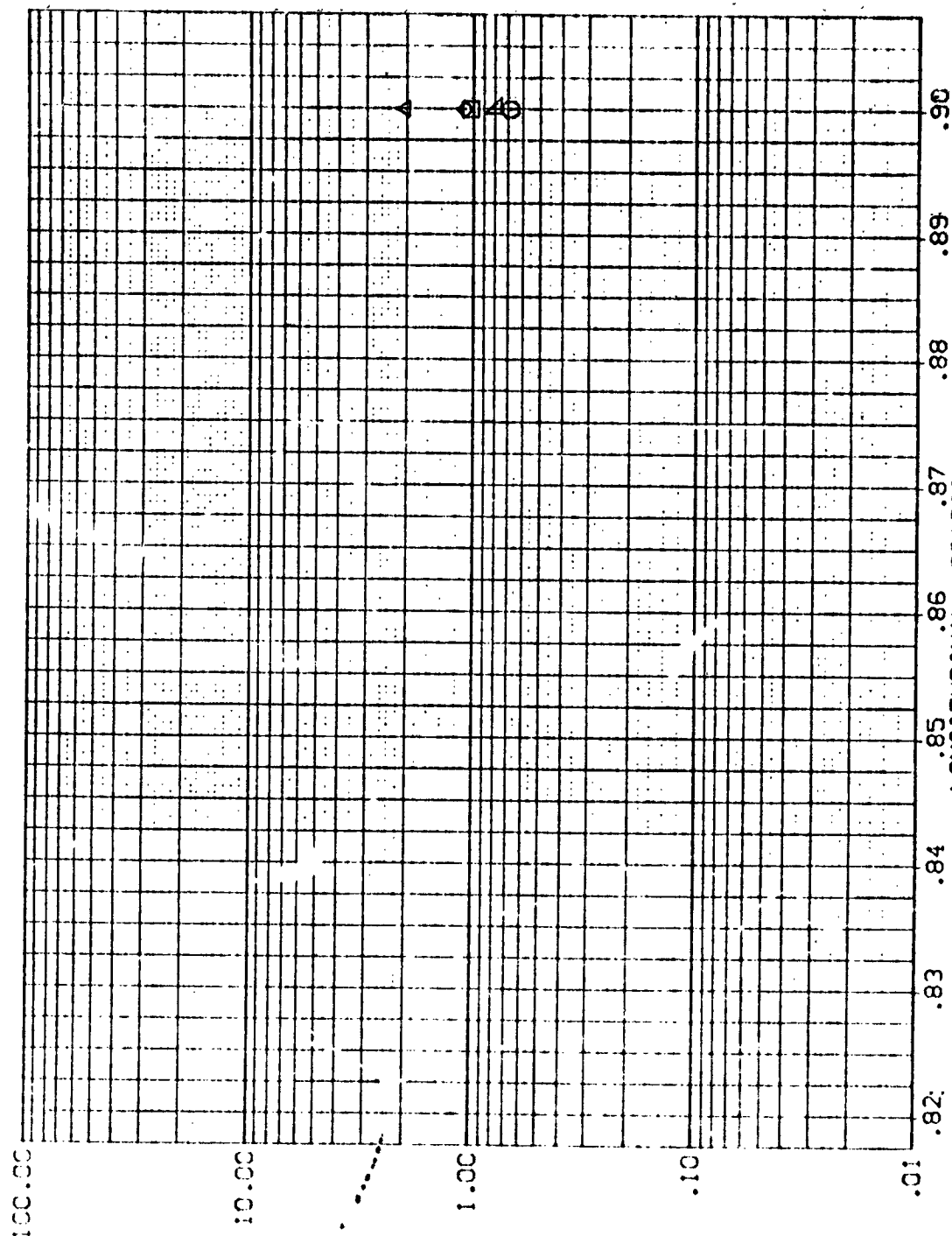


FIG. 15 OMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

$$5.300 \cdot 10^4 \text{ t} = 5.300 \cdot 10^4 \cdot 10^3 \text{ kg} = 5.300 \cdot 10^7 \text{ kg}$$

DATA SET SYMBOL      CONFIGURATION DESCRIPTION      ALPHA      BETA      RV/L

(BE001)	AVES 3.5-195 IH28 01+T1 CMS PODS	.000	.000	.000
(BE002)	AVES 3.5-195 IH28 01+T1 CMS PODS	30.000	.000	.000
(BE003)	AVES 3.5-195 IH28 01+T1 CMS PODS	50.000	.000	.000
(BE004)	AVES 3.5-195 IH28 01+T1 CMS PODS	90.000	.000	.000
(BE005)	AVES 3.5-195 IH28 01+T1 CMS PODS	120.000	.000	1.000

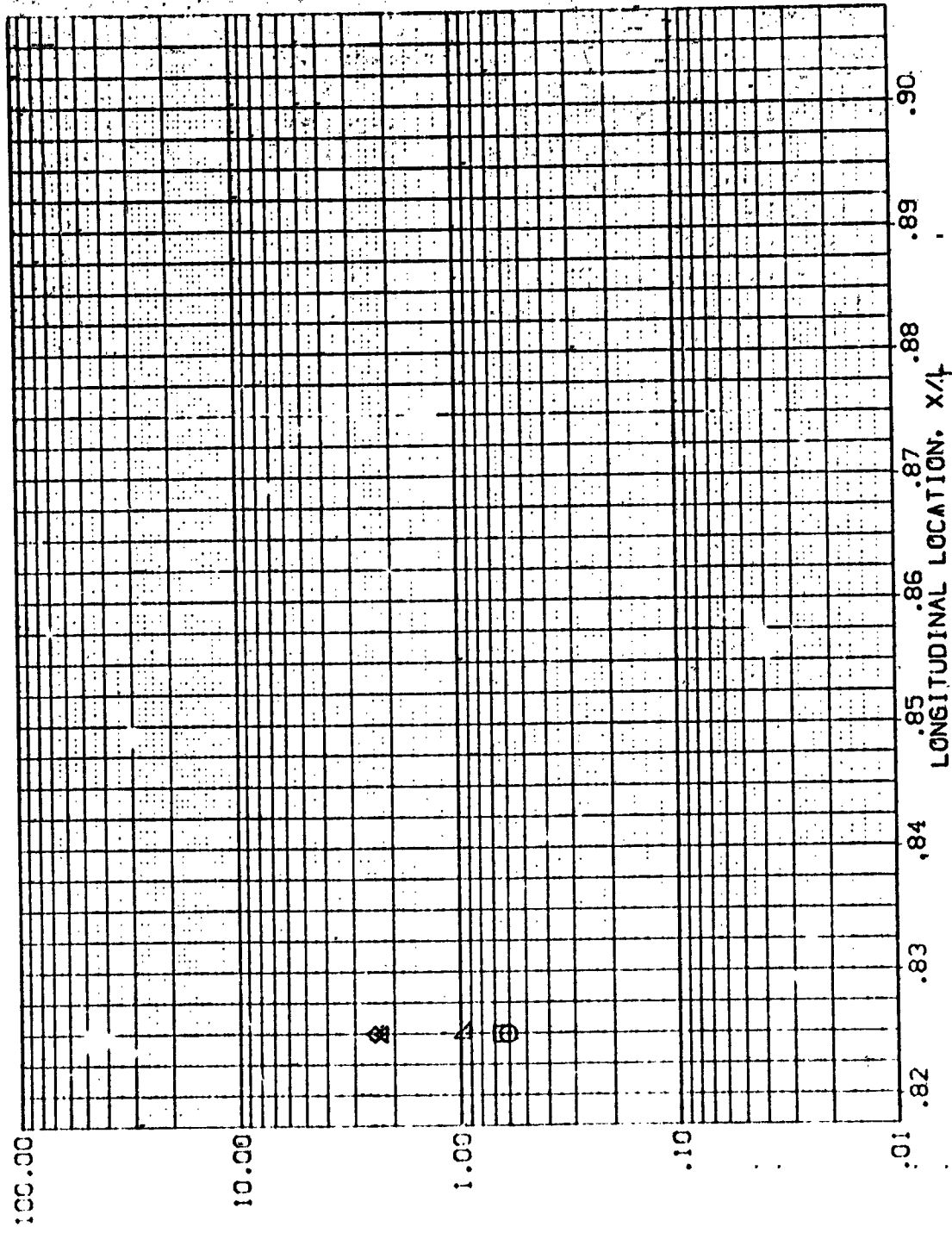


FIG. 15 CMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

LONGITUDINAL LOCATION, X/L



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

DATA SET 5-22-  
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 002  
 003  
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ALPHA BETA F/L  
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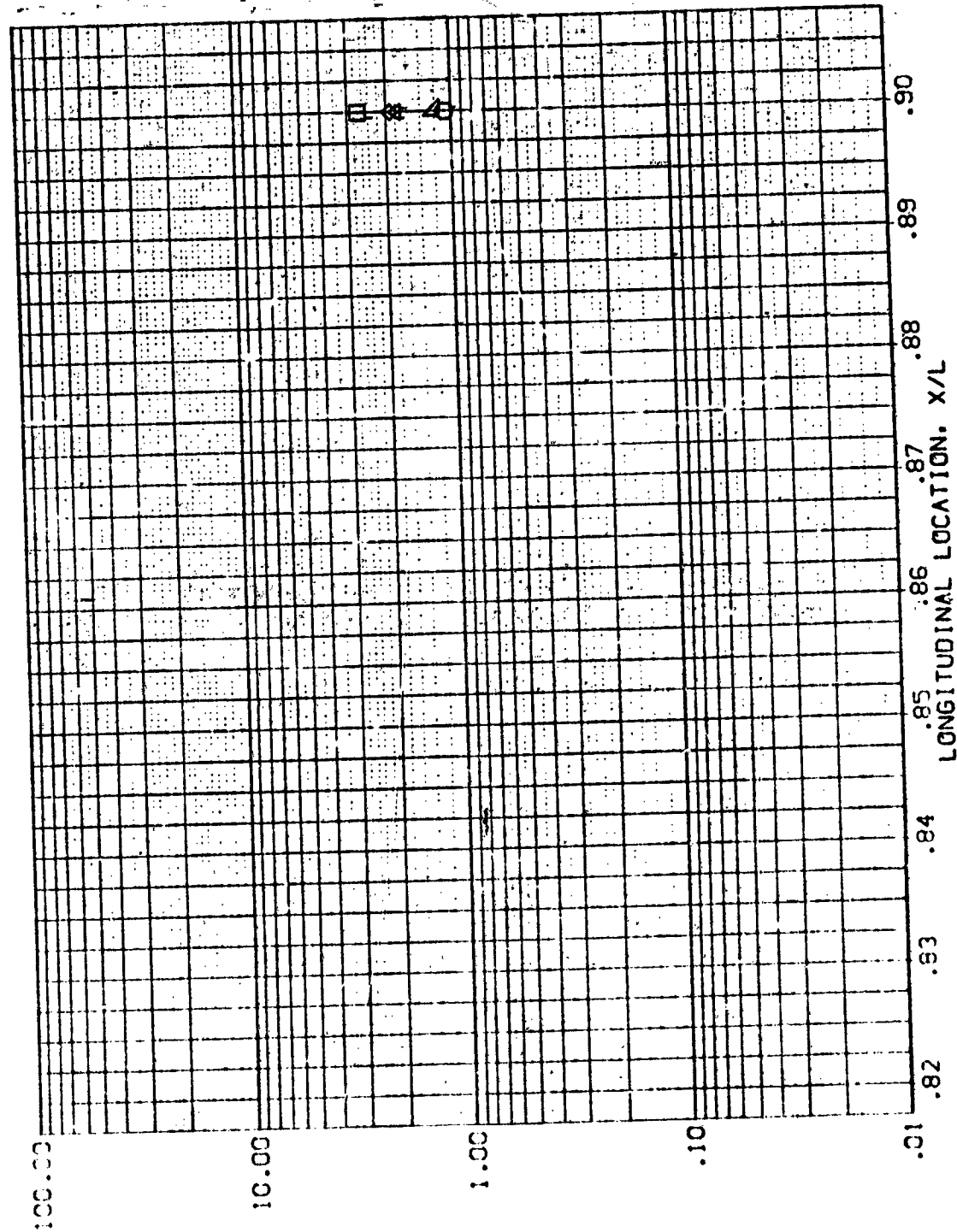


FIG. 15 OMS PODS. RATIO OF INTERFERENCE TO UNDISTURBED

SWACH = 5.200 -A = 0.300 Z = 476.660

REFERENCE JOURNAL  
 JPL-80-100, PAGE 18

DATA SET SYMBOL      CONFIGURATION DESCRIPTION      POOS      ALPHA      BETA      RNL

AMES 3.5-195 1428 CI+T1 GMS POOS      .000      .000      1.000

AMES 3.5-195 1428 CI+T1 GMS POOS      30.000      .000      1.000

AMES 3.5-195 1428 CI+T1 GMS POOS      60.000      .000      1.000

AMES 3.5-195 1428 CI+T1 GMS POOS      90.000      .000      1.000

AMES 3.5-195 1428 CI+T1 GMS POOS      120.000      .000      1.000

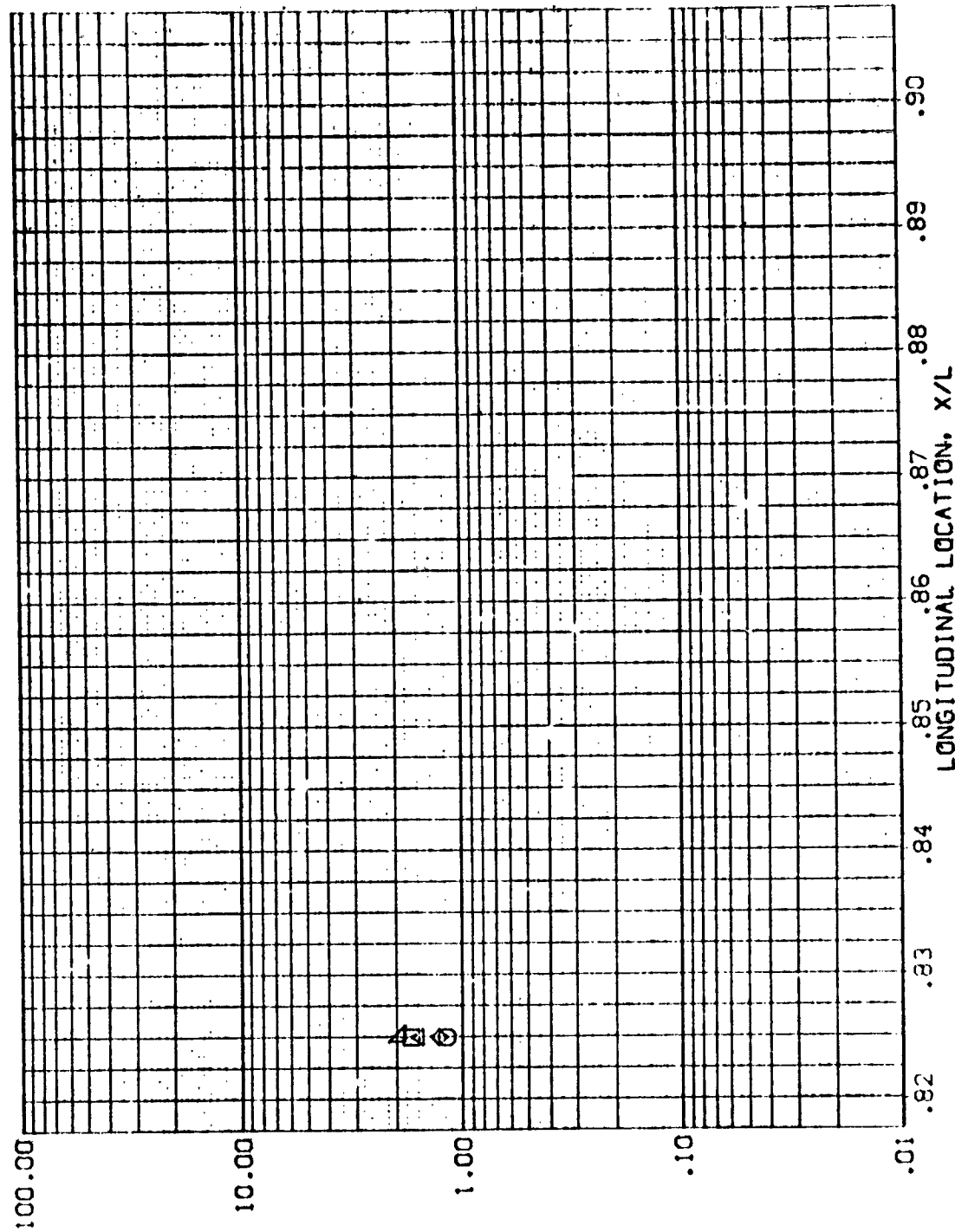


FIG. 15 GMS POOS, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $h/h_0$

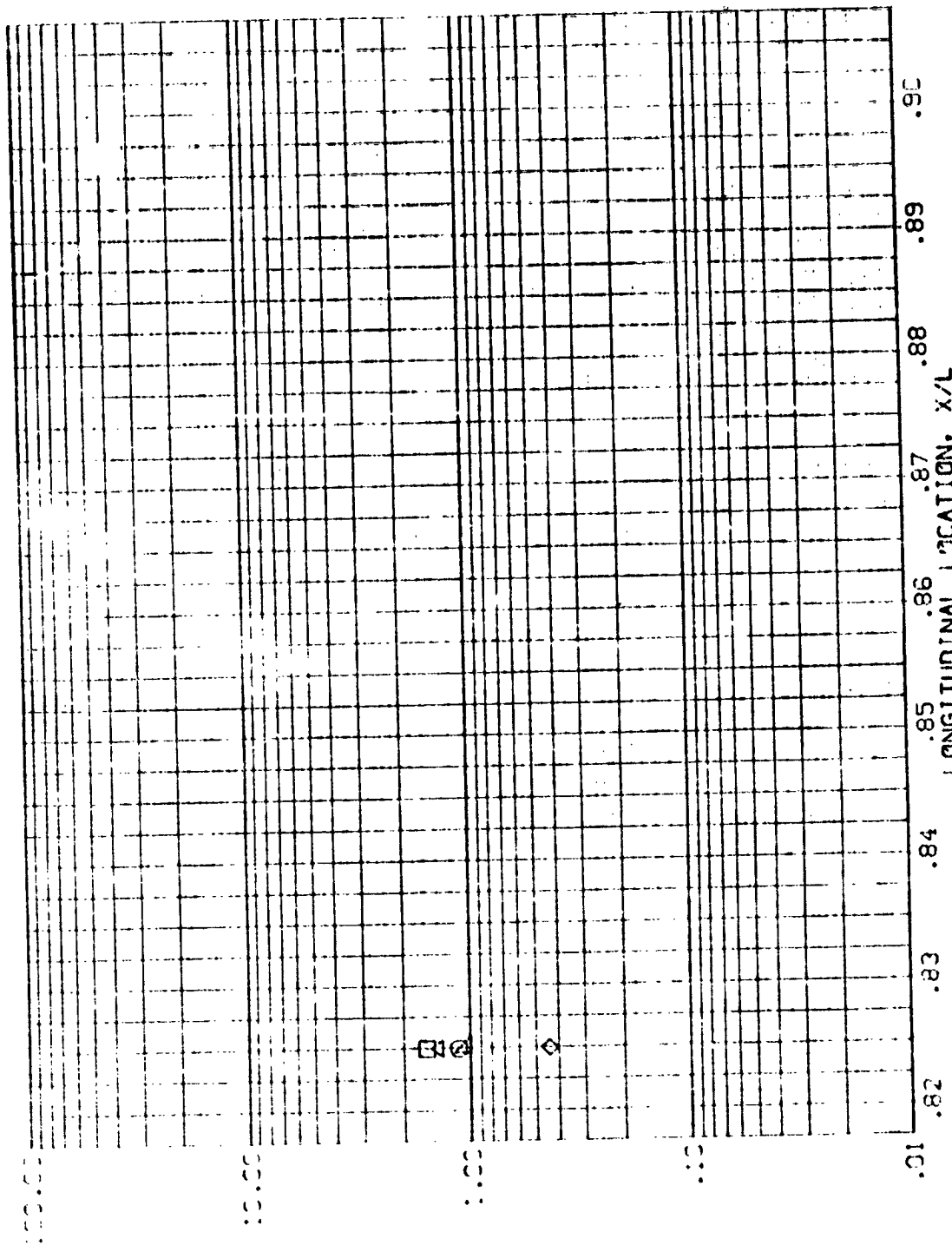
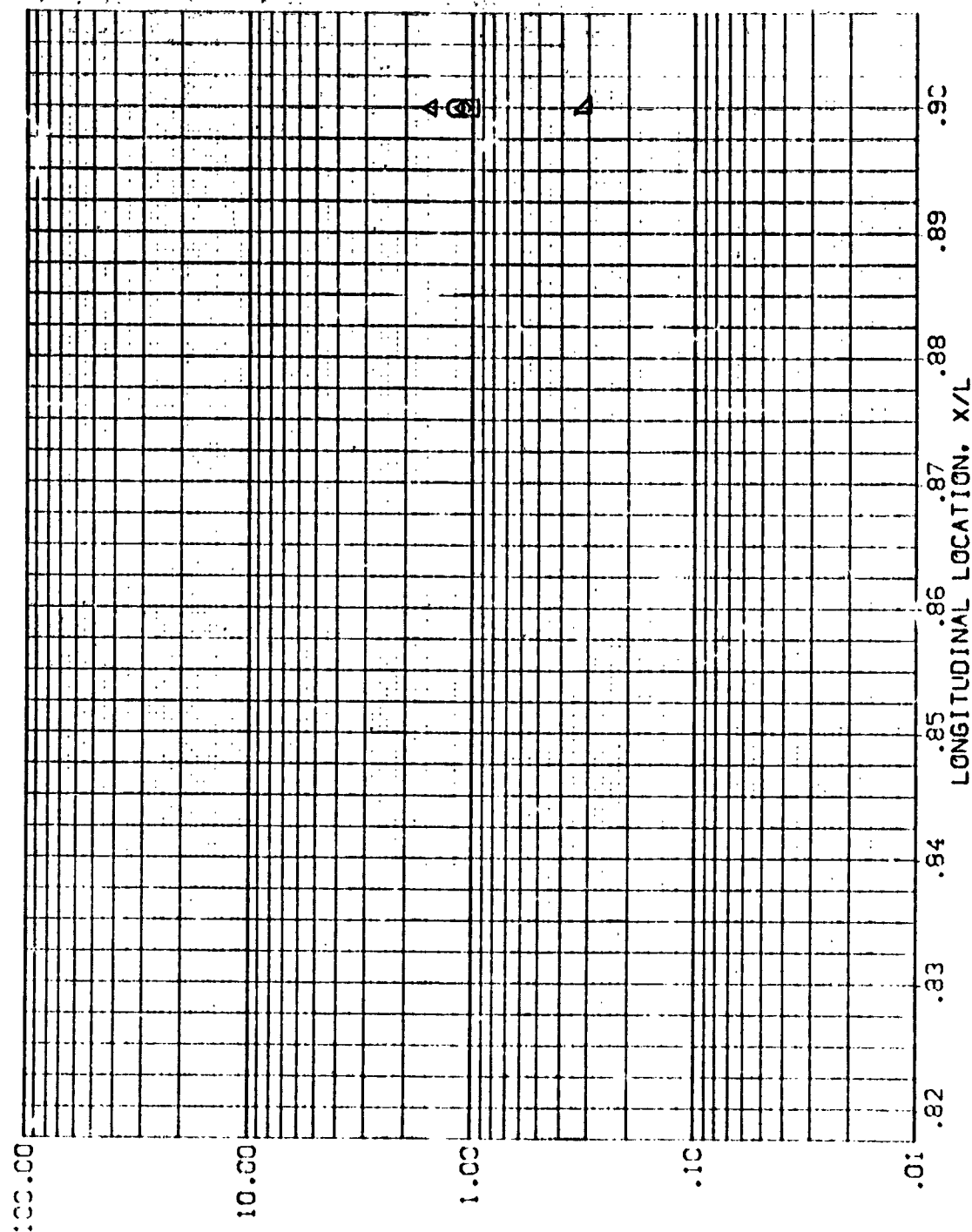


FIG. 15 RMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

WACH = 5.300 WACH = .900 Z = 510.000

ALPHA	BETA	RN'L
.000	.000	1.000
30.000	.000	1.000
60.000	.000	1.000
90.000	.000	1.000
120.000	.000	1.000



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS,  $H/H_0$

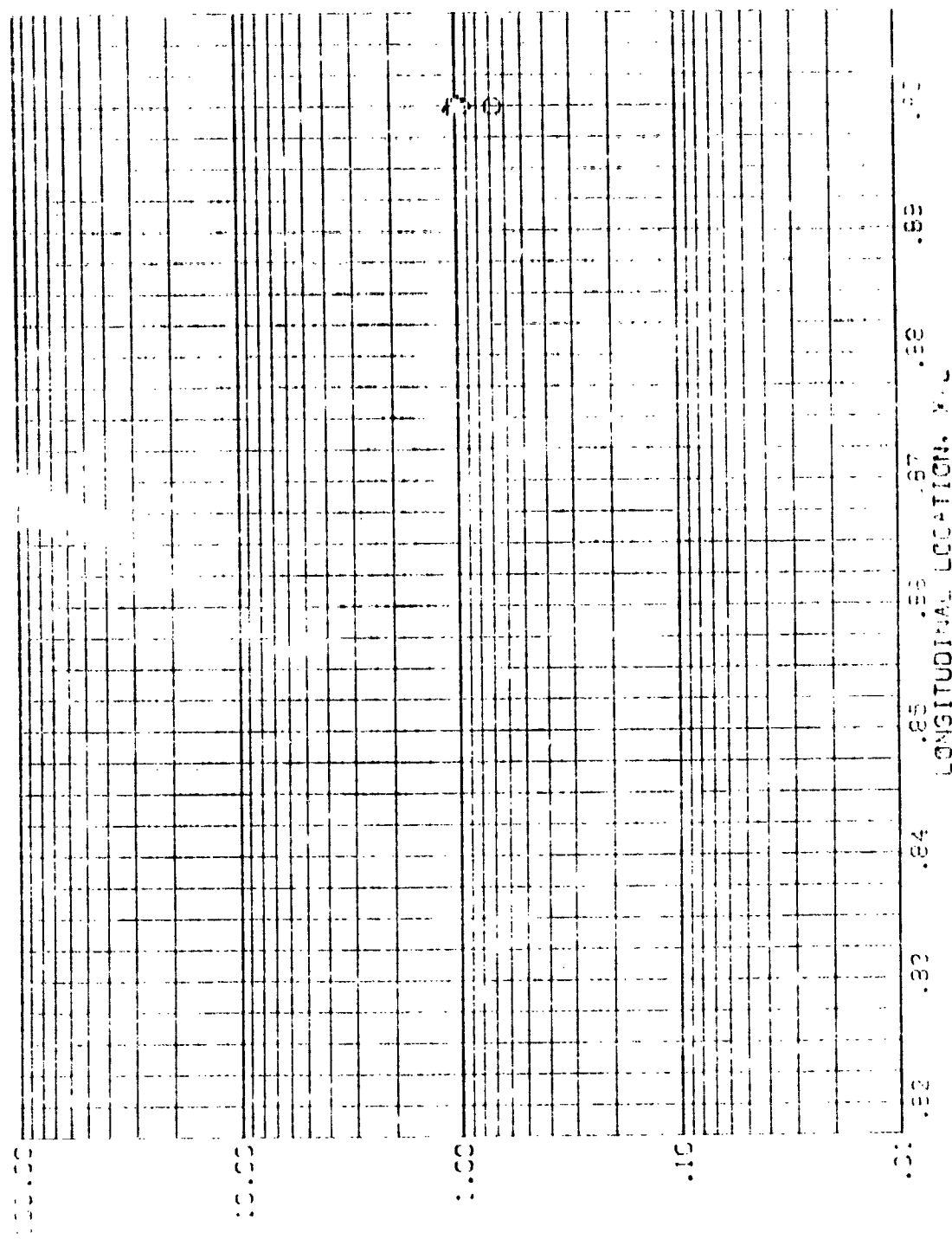


FIG. 15. 0.15 PDS, RATIO OF INTERFERENCE TO UNDISTURBED

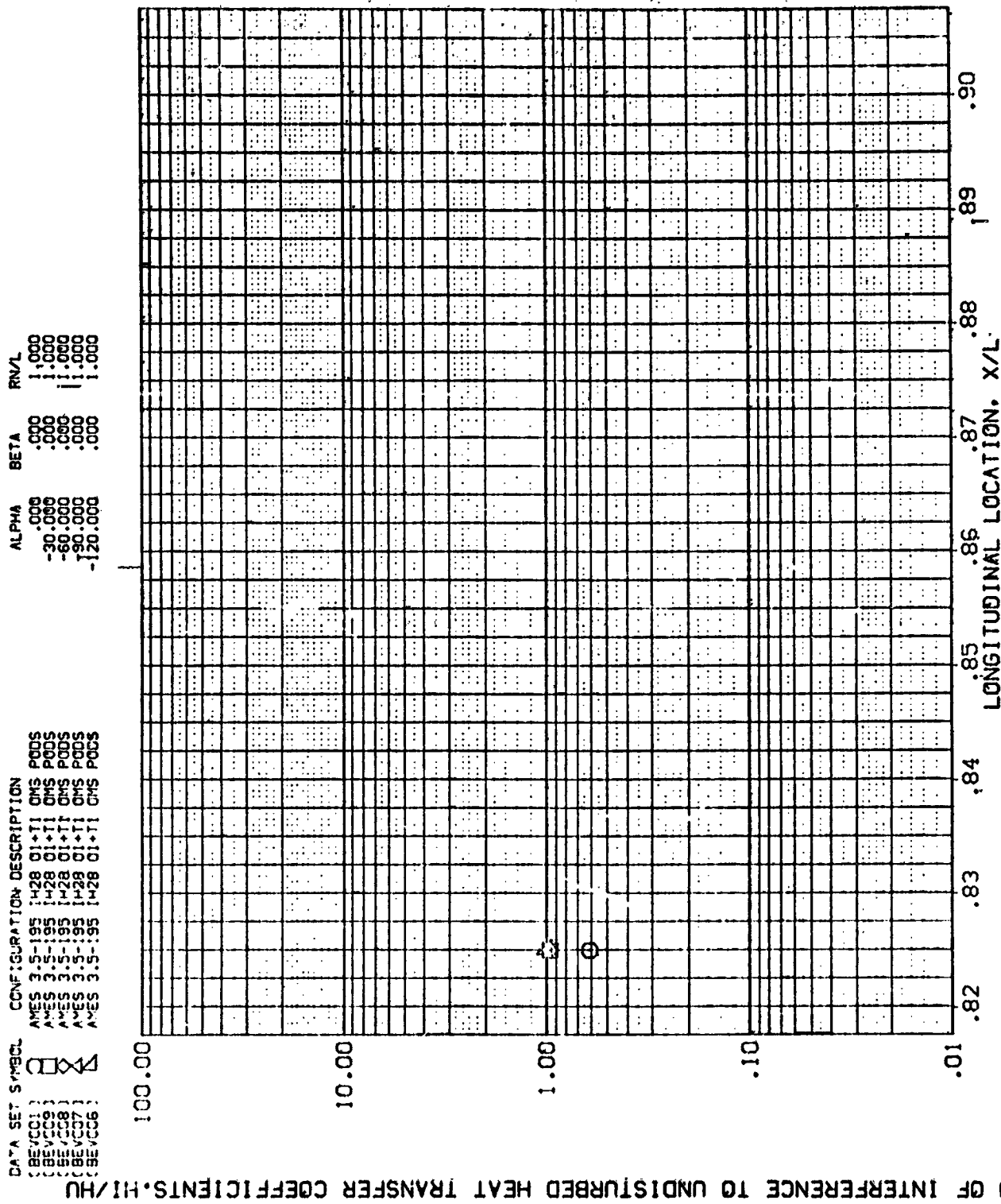


FIG. 15 OMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (BEV001) AMES 3.5-195 1428 01+11 0MS PODS  
 (BEV002) AMES 3.5-195 1428 01+11 0MS PODS  
 (BEV003) AMES 3.5-195 1428 01+11 0MS PODS  
 (BEV004) AMES 3.5-195 1428 01+11 0MS PODS  
 (BEV005) AMES 3.5-195 1428 01+11 0MS PODS  
 (BEV006) AMES 3.5-195 1428 01+11 0MS PODS

ALPHA BETA PN/L  
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 -30.000 .000 1.000  
 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

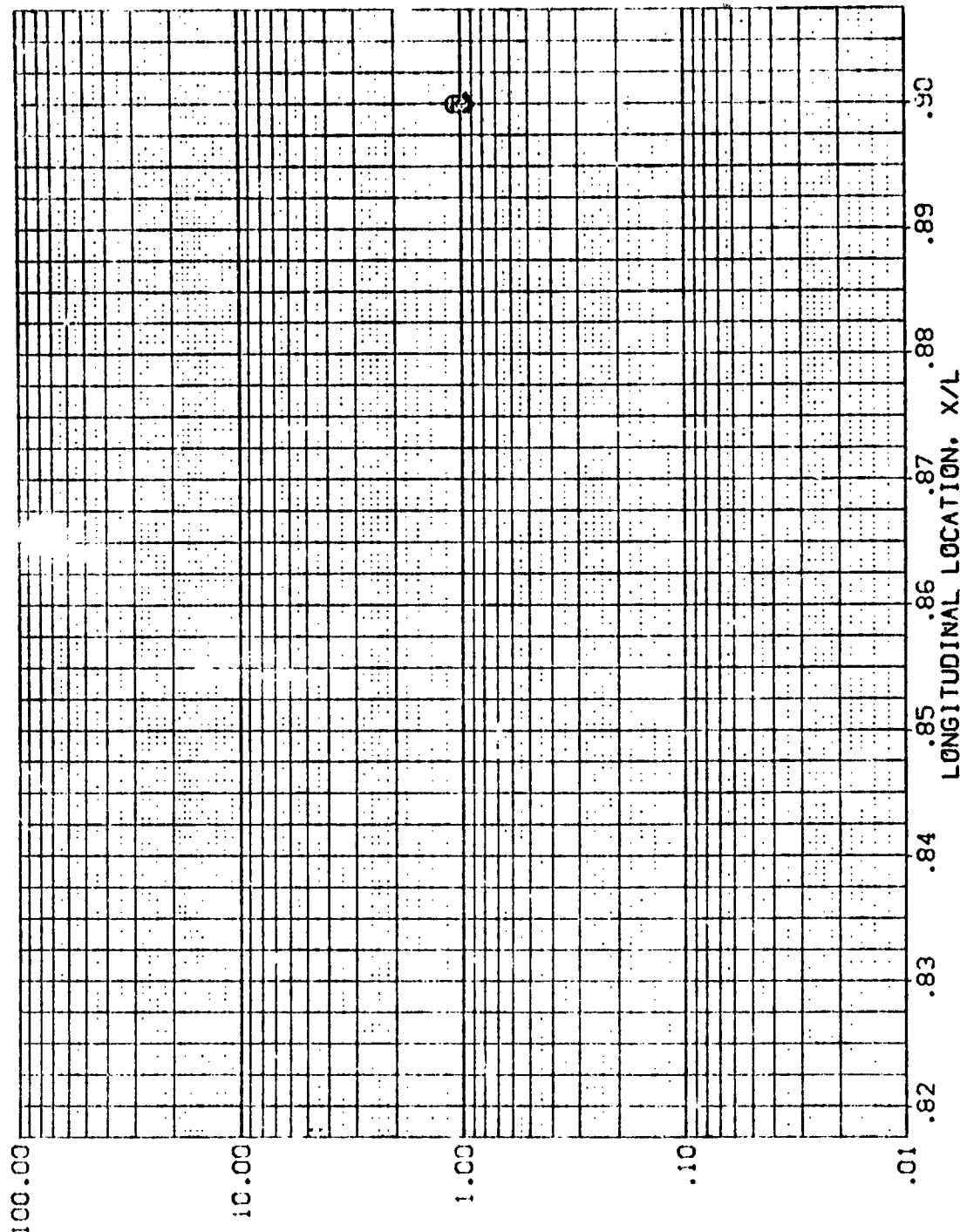


FIG. 15 0MS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

BRANCH = 5.300 HAW/HT= .900 Z = 476.660

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	BETA	RN/L
(BEVC01)	AMES 3.5-195 IH28 01+11 QMS PODS	.000	.000	1.000
(BEVC09)	AMES 3.5-195 IH28 01+11 QMS PODS	.30.000	.000	1.000
(BEVC08)	AMES 3.5-195 IH28 01+11 QMS PODS	1.60.000	.000	1.000
(BEVC07)	AMES 3.5-195 IH28 01+11 QMS PODS	50.000	.000	1.000
(BEVC06)	AMES 3.5-195 IH28 01+11 QMS PODS	128.000	.000	1.000

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

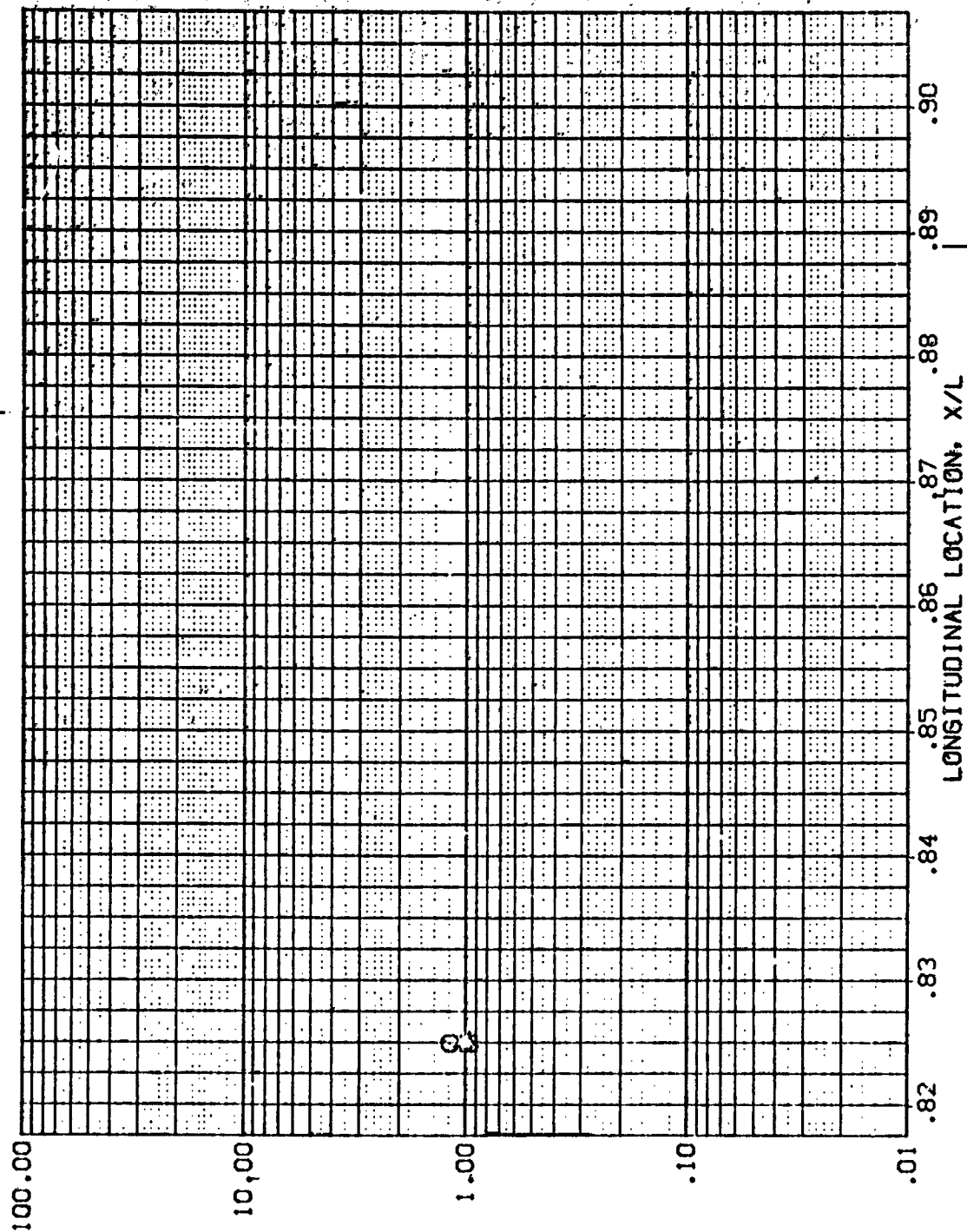


FIG. 15 QMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

WAXACH = 5.300 HAW/HT = .900 Z = 488.300



RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (00000000) ASES 3.5-3.5 H28 01+11 CMS PODS  
 (00000000) ASES 3.5-3.5 H28 01+11 CMS PODS  
 (00000000) ASES 3.5-3.5 H28 01+11 CMS PODS  
 (00000000) ASES 3.5-3.5 H28 01+11 CMS PODS  
 (00000000) ASES 3.5-3.5 H28 01+11 CMS PODS

ALPHA BETA RV/L  
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 -60.000 .000 1.000  
 -90.000 .000 1.000  
 -120.000 .000 1.000

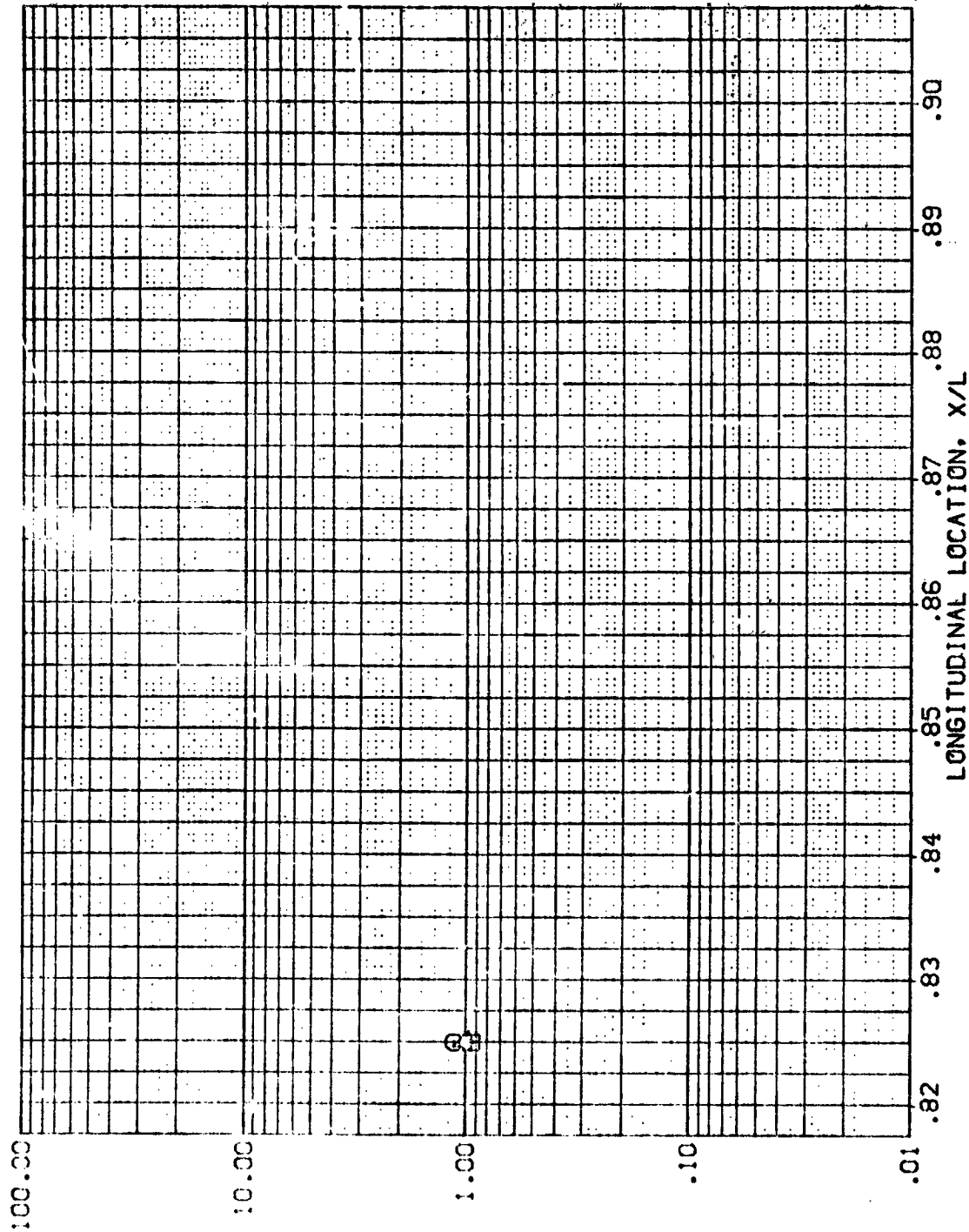


FIG. 15 CMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

MACH = 5.300 HAW/HT = .900 Z = 510.000

DATA SET SYMBOL CONFIGURATION DESCRIPTION  
 (BEVCC1) AMES 3.5-195 IH28 01+11 OMS PODS  
 (BEVCC2) AMES 3.5-195 IH28 01+11 OMS PODS  
 (BEVCC3) AMES 3.5-195 IH28 01+11 OMS PODS  
 (BEVCC4) AMES 3.5-195 IH28 01+11 OMS PODS  
 (BEVCC5) AMES 3.5-195 IH28 01+11 OMS PODS  
 (BEVCC6) AMES 3.5-195 IH28 01+11 OMS PODS

ALPHA BETA RV/L  
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 -90.000 .000 1.000  
 -120.000 .000 1.000

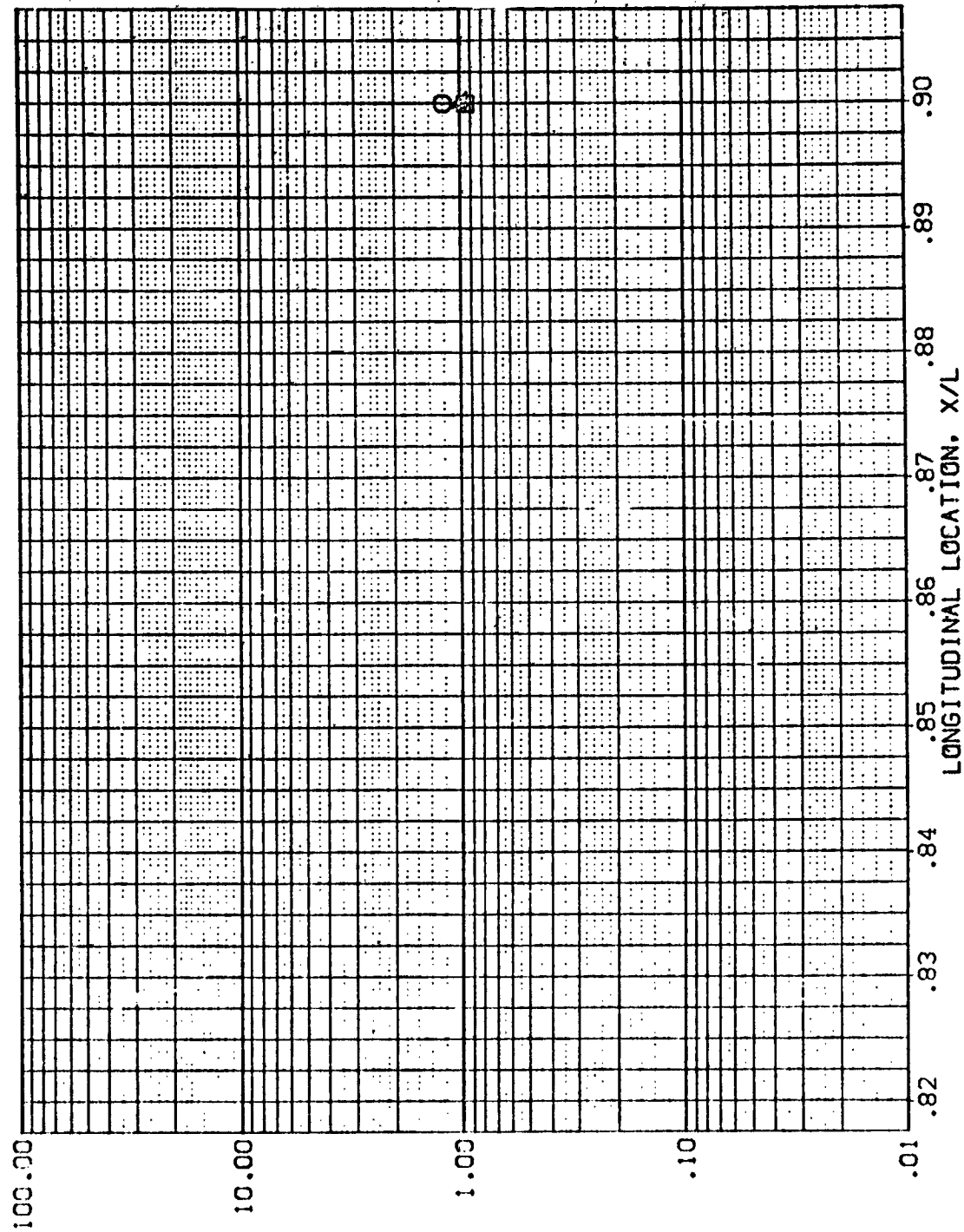


FIG. 15 OMS PODS, RATIO OF INTERFERENCE TO UNDISTURBED

RATIO OF INTERFERENCE TO UNDISTURBED HEAT TRANSFER COEFFICIENTS, HI/HU = 5.300 HAW/HT = .900 Z = 526.660